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Presidential Address*

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ON behalf of my fellow members of the American Public Health Association it gives me pleasure to express our very sincere appreciation of the opportunity which has been given us to meet in this city which nature and man have combined to make beautiful—a city which, for every educated person, has written upon each page of its history, covering nearly 300 years, romance and tragedy, as well as glorious achievements, both by the early French settlers and their religious leaders and by the British who followed.

We are particularly appreciative of the honor of having your welcome extended by such distinguished representatives of the Dominion, Province, Municipality, and Church.

Those of us who belong to medicine and its allied branches, and whose life work is devoted to preventive and curative medicine, feel that perhaps we have some claim upon your great country and her hospitality; for while this city began as a religious colony when Maisonneuve and his little band of religious enthusiasts landed here May 18, 1642, and while the wilderness was conquered by priests and soldiers and statesmen, we like to recall that the first man to bring out his family and make his home in Canada was the apothecary Hebert, and that the first man to found a seigniory and settle it with inhabitants was Dr. Robert Giffard, Seignior of Beauport. Nor do we like to forget that it was to this same Dr. Giffard that King Louis XIV gave the first patent of nobility granted an inhabitant of Canada.

It is pleasant, too, for us to know that in your later years a country doctor became Premier of Nova Scotia, your High Commissioner in London, and finally Prime Minister of Canada.

* Delivered before the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 14, 1931.

We feel that with such an history and tradition it is little wonder that you have builded such magnificent medical schools, laboratories, and hospitals with a splendid succession of clinicians and research workers from whose ranks we of the United States have so freely drawn and to whom the world owes much.

May I not add that, as Chief of the U. S. Public Health Service, and personally, I do not feel the need of any formal invitation to come into the territory of my friend, your Deputy Minister of Health, Colonel Amyot, who for years in the laboratory, later on the field of battle, and in the field of preventive medicine, has won the respect and affection of all of his colleagues, both on this continent and abroad. I am sure he has the same sentiments toward us. We accept reciprocally and without reservation the statements made and the procedure adopted by each other in international matters under our respective jurisdictions, and feel free to call upon each other for aid in times of stress and trial; while in international bodies we have nearly always voted together.

Throughout the ages it has been the custom of religious bodies to impose upon themselves various kinds of self punishment for the good of their souls and for after recompense, reward, and relaxation. Following their example this Association, in common with other similar scientific bodies, has imposed upon such of its members as are present the penance of listening to its President for the time being report upon the state of health of America, and upon its internal affairs. From year to year my predecessors have in pessimistic tones "viewed with alarm," or with triumphant voices have "pointed with pride." You are about to have this penance inflicted upon you.

Our Association, in common with all of the social clubs, voluntary and scientific organizations with which I am familiar, has suffered both in membership and in the collection of dues as the result of the world-wide economic depression. This Association has not suffered more than others and I see no reason for undue pessimism.

You are familiar with the fact that our Secretary, Mr. Calver, after a number of years of devoted service, resigned last spring. I am sure you all will join me in wishing him success.

I deem it one of the most fortunate events in the history of the Association that the Executive Board succeeded in persuading Dr. Kendall Emerson to become our Executive Secretary; for he has brought to us a wide experience here and abroad, a seasoned, sound judgment, a rare personality and wide acquaintanceship which it would be difficult to duplicate. I hope that he may be persuaded to remain.

I am sure that all of you who have an opportunity to read the

JOURNAL of the Association will agree with me that it has never been so well edited or contained such interesting and constructive material as during the past year, and that you will join with me in an appreciation of the work which has been done by the editor, Dr. Ravenel, and his coworkers.

The Association has suffered during the past few weeks an almost irreparable loss in the death of our President-Elect, Dr. William C. Hassler, Health Officer of San Francisco, and Dr. Lee K. Frankel, one of our former presidents.

I have known Dr. Hassler for 30 years; he was a man of the highest personal integrity and honor, a man of strong convictions and unswerving loyalty to his friends and ideals, and a loyal and devoted member of the Association. When I was asked several years ago to nominate a municipal health officer for a League of Nations Interchange in Europe I unhesitatingly suggested Dr. Hassler.

Lee K. Frankel we all knew and loved. Devoted to the betterment of his fellow man, he brought into his work a catholicity of interests, a splendid intellect and judgment, combined with a gentle nature which endeared him to all with whom he came into contact. Providence placed him where he had large opportunities for good, and he employed them to the utmost. Few men have done more for the health and happiness of their fellow men.

I suggest that we all stand for a moment with the prayer that their lives may serve to stimulate those of us who carry on their work.

Within the memory of many of us our race has passed through an epoch-making period unequaled in the annals of history; in its beginning little more was known of the etiology and epidemiology of disease than in the period of Hippocrates; synthetic chemistry was unborn; in applied physics the electric light and telephone were curiosities; in transportation the first electric tram was used; in sociology there was but the first awakening of the public consciousness of the duty and necessity of community effort and of the close interdependence of the different classes of society.

It is unnecessary for me to attempt to recall to such an audience the developments, the changes, the discoveries, during this period; we have eaten largely of the fruit of the tree of knowledge.

And into this great period came the World War and its immediate aftermath, the destruction of old landmarks in politics, in faith, apparently in all things that were.

The fever of war was apparently diverted into other fields of activity. The war itself had brought about the recognition of the necessity for group action in production, transportation, and health, no less

than in military movements; and indeed for the first time there was a consciousness of the dependence of military success upon concerted action by the civil population. Large sums of money and large powers were given for the purpose of improving the health and welfare of noncombatants. Not infrequently these powers and resources were placed in the hands of inexperienced but ardent patriots who for one reason or other were not in the military forces of the country and who were not familiar with the traditions, laws, and the orderly procedure of our forms of government.

It is perhaps significant, too, in this respect that it was during such an unsettled period that we had in the United States national woman suffrage for the first time, and that in all of the allied countries women were first brought into public life and political power.

Largely as a result of this increased consciousness of the importance of the public health movement having been awakened in the mass of our population, there has been a constantly broadening interest in the whole field. Not only has this been true among those elements interested chiefly in the humanitarian side, but, perhaps more important, industry and finance have been made aware of the vital significance of mental and physical well-being, not only to the individual, but to themselves and to government. Leaders in industry and finance have had brought to them the enormous dividends from true research by competent personnel.

During this same period our countries have had an unprecedented era of prosperity for the masses and the accumulation of great fortunes by individuals and corporations.

As a result of popular interest and demand on the one hand, local, state, and national health organizations have had their fields of activity broadened and their resources increased, while individuals have given enormous sums of money for the enlargement of existing, and the creation of new endowments and funds for the promotion of health and welfare, not only in the United States but throughout the world.

Able and willing to pay larger salaries and affording greater opportunities for usefulness than most governmental agencies, and with the wise advice of great men, an inestimable good has been done by many such endowments and nonofficial agencies, not only directly in the work they have done in field, laboratory, and schools, but perhaps even more in their education of the people and stimulation of governmental activities; for in any representative form of government, official action follows public sentiment and urge. The improvement in health conditions owes much not only to such members of the medical and allied professions, but to the non-medical socially minded men and women who have led such movements.

Unfortunately, however, the ease with which fortunes have been accumulated during this period has resulted in some instances in exemplification of the old adage, "Easy come, easy go." Many of us in a position to observe have been astonished at the ease with which often honest but incapable enthusiasts have secured large sums of money which have been dissipated in unwise and ill-directed research or investigations, and out of which has arisen a mushroom-like crop of so-called experts in various lines of health and welfare endeavor. We have had several examples of this during the past year. It is scarcely necessary to invite the attention of both medical and allied professions to the danger of such movements.

There is another problem which I feel it my duty to bring to your attention. I do this with some hesitation, because it is apparently a reflection upon scientific men as a body. Few men and women in medical and allied public health professions perhaps realize the effect of the rapid advances which are being made in industry, particularly in chemistry, upon the inter-relationship between industry, public health, and the public whom they serve. On the one hand large corporations are maintaining at great expense research workers and laboratories not only for purposes of advancing their interests by scientific research but for necessary defense purposes, just as their legal departments are maintained. On the other hand, our educational institutions, as well as individuals, have research laboratories, in most of which earnest work is being done in scientific spirit for the betterment of their clients and the public. Unfortunately, however, not all of the individuals who labor in the realms of science are perfect, and from time to time there is being brought to the attention of those of us in public office apparent attempts to threaten corporations which would seem to border very closely upon the high-jacking and blackmailing of other classes.

It seems to me to be a peculiar duty of this Association to exercise such influence upon its members as may best cause the retention by them of a true scientific attitude, whether it be after accepting an honorarium or in the course of governmental work. There is perhaps in this field of professional endeavor as nowhere else necessity for calm judgment, ability to recognize a balance of values, and intellectual honesty which after all is the most important attribute of a true scientist.

I venture to say that our Association itself should be particularly careful to observe that injunction of the Apostle, "Avoid the appearance of evil."

There is another condition in connection with the present state of

research, curative and preventive medicine which is well worth the serious concern of this Association and which has recently attracted the attention of our sister organization, the American Medical Association. The applications of the results of research in physics and chemistry to medicine are now rapidly made known to the public at large through the medium of the press, radio, and the moving picture.

Medicine, health, and hygiene are popular subjects for exploitation by both the trained and untrained. Advantage is being taken by certain commercial interests of this general interest in and superficial knowledge of such matters as the use of the different wave lengths of the spectrum, and of the existence in foods of the so-called vitamin group, until their extravagant and unwarranted claims in some instances result in danger to the public through their use by unskilled persons, and on the other hand in waste of the public's money for the purchase of articles and foods which have no particular value as curative agents. This constitutes a problem not only because of the financial aspect of the matter, but because it inevitably will result in disappointment, disillusionment, and contempt for real achievement in science.

That there has been a greater advance in both curative and preventive medicine during the past few decades than in any previous era is demonstrated by the results, as shown by lessened mortality and morbidity rates, as well as by the public interest, to which allusion has already been made, as manifested both by voluntary organizations and by largely increased appropriations by municipal, state, and federal governments. It is not necessarily disparaging to say that much of this effort and large sums of money have perhaps been dissipated in our progress. Medicine and sanitation are not alone in not having arrived at perfection. This is perhaps not the time or place to compare our efficiency with that of other lines of individual and governmental effort.

There is, it seems to me, at least in the United States, a most serious problem upon the solution of which we should concentrate our efforts during the coming years. That the United States is not unique in this respect is shown by the following quotation from that extremely interesting book, "Four Centuries of Medicine in Canada":

> Public health in Canada is not yet freed from the politician who overrides the recommendations of the fully qualified public health official, makes appointments, as he sees fit, that destroy the morale of the entire working system of the department and indefinitely retard progress; nor is it freed from the untrained, unqualified official who to win recommendation will stoop to plunder.

I allude to the unsatisfactory condition which exists through almost all of our country in respect of the personnel in public health

work, especially regarding methods of selection, tenure of office, and compensation. Until recent years the only school for public officials was the school of experience, a rule of trial and error; and we know many leaders now living, and recall others dead, who have blazed the way for those of us who are still carrying on. But we must remember that public health work only a few years ago consisted chiefly of suppressing epidemic diseases, improving environmental conditions and safeguarding milk and water supplies; and such men grew along with our broadening conceptions and knowledge.

As a result of recent discoveries in the sciences and their application to public health, and no less as a consequence of the realization of the truths of the interdependence of individuals, and even of nations—that "no man liveth unto himself and no man dieth to himself," that the strength of a people depends upon the moral, mental and physical health of its individuals—there has come a realization that the public health is influenced by environment, heredity, industry, economics, morality, education. The insanitary dwelling, the malarial stream, the syphilitic or idiot parent, the hazards of dusts or poisons, the living wage, temperate life, knowledge of diseases and how to avoid them, all come within the sphere of the present public health movement.

Nor is there justification for that artificial division of medical science into preventive and curative medicine. We are all members of the same body whose object is to prevent illness and pain and premature death. The interests of the people, as represented by government, are equally affected by helpless individuals, whether made so by heart disease, rheumatism, or paresis, as by smallpox or plague or poliomyelitis.

The research worker in the laboratory or in the field of epidemiology and the surgeon or physician at the bedside are all directly or indirectly, consciously or unconsciously, public servants working for the public good.

The ideal for which we aim is the application of every available means for the prevention of disease or injury and the provision of suitable treatment for all sick or injured. The problem is how this ideal may be attained with the greatest good to the common weal.

The solution is not to be found by mathematical formulas nor endemic nor ecumenical council; it will differ in some phases in different countries, states, or provinces, indeed in each community.

Neither bench nor bar, pulpit nor national military defense, needs men of greater professional training, of sounder judgment and courage than are required for the solution of these problems.

Public health is a specialty; but just as one who knows only op-

erative surgery is a poor surgeon, so should the efficient health officer have an intimate knowledge of the whole field of medicine. There is no longer any dearth of facilities and opportunities for the education and training of suitable men who choose as their life work leadership and general staff work in the field of public health; not only have individuals and foundations built magnificent schools of public health manned with able faculties, but there are opportunities in the federal and in some of the state and provincial services and laboratories for such training. Even more important in a broader sense is the commendable action which is being taken in some of our best medical schools to teach the preventive medicine and public health import of practising medicine to all medical students.

We may no longer consider as a complete or efficient state or local health organization a small group of salaried officials who confine themselves to the suppression of epidemics, the collection of vital statistics, and the enforcement of ordinances. These are necessary for staff and intelligence, for research in field and laboratory, but it is also necessary that the local state or provincial medical associations shall be brought into close relationship, that there shall be a mutual understanding with them and with voluntary agencies so that all may work together toward the common end. You will pardon me if I mention Detroit as one example of what may be done.

But to reach this goal there must be competent leadership. There have been in the past, and are now, many great leaders in the field of preventive medicine, pioneers, men of initiative, men with broad, almost prophetic vision; but I am sure that you will agree with me that there is room for much improvement, that the general average of health officers, particularly in the local field, leaves much to be desired, and that, consequently, there has been an unnecessary waste both of effort and money to accomplish the results which have already been attained and which makes much more difficult future progress.

During the past decade or so in the world of industry and finance, both in our countries and abroad, there has been occurring reckless advance in all lines of human endeavor without due thought for possible days of adversity and need. This has been true in public health and welfare as well as in other fields. We have reached the stage now where it is not only desirable and wise, but necessary, that we should not remain passive in a state of pessimism and despair but in a truly scientific spirit should carefully study the mistakes which have been made in the past and survey our course for the future. This is no less necessary for this Association than for governmental and non-governmental agencies, and I commend to your careful consideration a study

of the budgetary possibilities of the Association with a view to governing our activities accordingly.

The people of our European and American regions came out of the World War feeling that the old order had changed and all things were new in the social and political world; nations and individuals were torn from their moorings, swept away from their courses. Scientists and sociologists entered into a decade unparalleled in its feverish activity. The veil of mystery was torn from many secrets of chemistry and physics, and the habits and very thoughts of people were changed. History and experience were considered with contempt, and warnings of the thoughtful were but voices crying in a wilderness.

Knowledge came, and with it apparently universal wealth and prosperity; but wisdom lingered.

It is not necessary for me to tell you that this old world is a very sick patient now; following the period of maniac excitement there is a physical, mental, and moral depression. Around her are many would-be physicians, with nearly as many diagnoses and prognoses. Many are mistaking symptoms for causes, and are suggesting empirical or quack remedies; others are nihilistic in their therapy and pessimistic in their prognosis; while, thank God, there are others earnestly trying to find the true causes and their remedies.

It may well be that future generations will smilingly refer to this period as a beneficial purge given us in the Dispensation of Providence.

Meantime, may I not appeal to you of the medical and allied professions, trained as you are to contact the realities, to "sit steady in the boat" and, avoiding panic and pessimism, assist those whom we have in authority in our respective governments to resist the urge to give either stimulants or narcotics or remedies which, while they may give temporary relief, may cause irremediable injury to our countries and retard their convalescence.

I am particularly glad on this occasion, both on behalf of the Association and personally, to welcome our colleagues, Sir Allan Powell, Drs. Buchan, Porter, and Fenton, who have come to us from the Association of Medical Officers of Health of Great Britain. I am sure that they have brought with them some of the wisdom and experience of that great Mother Country to whom we have looked in the past for leadership and inspiration in matters of public health.

Drought and Health*

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HISTORY abounds in instances of diseases following shortage of food, which may range from slight deficiency to absolute starvation. The Old Testament recounts many instances in which famine was sent upon the land resulting in pestilence and death. According to the belief at that time, these occurrences were due to the anger of God over the disobedience of his commands by his people, or the worship of false gods by other peoples.

> And I called for a drought upon the land, and upon the mountains, and upon the corn, and upon the new wine, and upon the oil, and upon that which the ground bringeth forth, and upon men, and upon cattle, and upon all the labor of the hands.[1]

A typical story is that of Elijah and Ahab. After some 3 years of drought and famine, Elijah entered into a contest with the prophets of Baal over calling fire down from heaven to consume a sacrifice. He won, and after slaying the prophets of Baal by the brook Kishon, Elijah said to Ahab:

> Get thee up, eat and drink; for there is a sound of abundance of rain. . . . And it came to pass in the mean while, that the heaven was black with clouds and wind, and there was a great rain.[2]

While modern science makes us reject the etiology accepted by the Old Testament peoples, these stories are interesting in showing the correctness of their observations and the recording of the facts.

There is no doubt that when there is lack of food on a large scale, such as may affect a community or a people, pestilence is sure to follow; and there is a widespread belief that famine is a direct cause of pestilence.

The lack of food, either as regards quantity or quality, certainly lowers resistance to certain infections, though not to all. The direct effect of starvation is a lack of vitality and increased susceptibility to disease. During times of food shortage an indirect effect is always seen in a lack of hygienic measures and cleanliness, an increase in

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

vermin, and the presence of other factors which favor the spread of certain diseases, especially typhus fever, plague, relapsing fever, and others of similar character.

During the World War we had a striking example of the effects of lack of food, which was deficient not only in quantity but also in quality, in the so-called war edema seen among the people of the Central Powers. This was clearly the result of underfeeding on a ration which was low in protein and deficient in fat. It was followed by displacements of the internal organs due to the loss of the supporting fat, and deficiency diseases such as rickets. The incidence of tuberculosis was increased and infectious diseases became more prevalent.

The most common cause of lack of food is failure of crops, which is usually more or less local. Where the means of transportation are lacking, or are destroyed, as during the great flood in the Mississippi Valley, starvation may occur though abundance of food is near at hand.

In 1921–1922, while some 25 million people were starving in the Volga region and several million died, there was a great surplus of food in America, Australia, Argentina, and even in parts of Russia. In 1930, while millions were starving in China, wheat was a drug on the market in practically all other countries.

While this discussion, as far as the public health aspects go, centers on the problems of drought, the Mississippi flood must be remembered, as the drought conditions now existing have been unquestionably aggravated by the destruction which took place during that disaster.

According to the U. S. Public Health Service, 22 states are included in the drought stricken area of this country, most of these being in the middle, south, and southwest.

Conditions became so bad that in February, 1931, Congress appropriated $2,000,000 to our Public Health Service for medical aid in these states. This was a strictly emergency measure, and the appropriation will cease to be available on June 30, 1932. It is perhaps needless to say that most of this money will be expended in the rural areas, the inhabitants of which have lost not only their staple food crops, but also their vegetable and garden crops. The rôle played by vitamins in nutrition emphasizes the seriousness of this latter item.

The engineering features of the situation are amply provided for in the reports which are to follow. It need only be said that throughout extensive areas not only have the crops been lost but there has also been a great shortage of water for household purposes and for cattle. The direct result has been that water has been hauled from unprotected streams and springs, wherever such sources were available, for drinking and to fill cisterns.

It is perhaps too early to form a definite opinion as to the effect of this measure as other factors have been concerned, the relative value of which we are unable to determine at present. In general it may be said that there has been an increase in the prevalence of intestinal troubles, particularly diarrhea and enteritis in children under 2 years of age. Other papers will give the details of the outbreaks of intestinal trouble observed in some of the eastern states, especially at Charleston, W. Va., and cities located along the Ohio Valley.

In Arkansas, Dr. Garrison, the Health Officer, reports the amount of malnutrition among rural children for 1930 is double that for 1929. The disturbed conditions relating to private, and in some cases public, water supplies were counteracted by intensive precautionary measures.

In that part of Missouri south of the Missouri River many cases of malnutrition have been observed, intestinal disorders have been common, and typhoid fever has increased markedly, as shown in the following figures:

Total for years 1929 and 1930:

1929—614 cases reported
1930—793 cases reported

Indicates an increase of 29 per cent.

Total for state last 6 months of 1929 and 1930:

Last 6 months 1929—341 cases reported
Last 6 months 1930—647 cases reported

Indicates an increase of 90 per cent.

Total for 55 drought counties 6 months of 1929 and 1930:

Last 6 months 1929—156 cases reported from 55 drought counties
Last 6 months 1930—352 cases reported from 55 drought counties

Indicates an increase of 125 per cent.

Total for 59 non-drought counties 6 months of 1929 and 1930:

Last 6 months 1929—185 cases reported from 59 non-drought counties
Last 6 months 1930—295 cases reported from 59 non-drought counties

Indicates an increase of 59.5 per cent.

The conditions in regard to typhoid fever are not quite so bad as the data seem to indicate, as the great increase was due largely to an epidemic in one county in which local factors seem to have played a part.

Reports from the directors of the units established for the drought emergency show a comparatively high incidence of malnutrition, as evidenced by underweight, and many cases of rickets have been observed, though it must be remembered that data for other years are not available.

In Tennessee there was a slight increase in typhoid fever, from 1,575 cases and 307 deaths in 1929 to 1,732 cases with 324 deaths in 1930, the rates being 11.8 and 12.4 for the 2 years respectively. The death rate from diarrhea and enteritis under 2 years of age increased from 23.8 in 1929 to 28.2 in 1930.

A bright spot in the returns is that there has been a decrease of almost 50 per cent in the cases and 20 per cent in deaths from malarial fever. It seems fair to believe that some of this decrease, at least, is due to drought conditions, although Tennessee has for some years past been carrying out an intensive anti-malarial campaign including the screening of houses.

In Kentucky, A. T. McCormack, M.D., State Health Officer, reports 100 more deaths from typhoid fever than in 1929, almost all of which occurred in counties without health organizations, and where little or no immunization was done. The death rate among children under 2 years from diarrheal diseases has been considerably increased, while outbreaks of diarrhea and dysentery have been reported.

In the counties with health organizations, there was good coöperation on the part of the people, and a large part of the drinking water was boiled. Nearly 1 million persons were immunized against typhoid fever.

The incidence of pellagra has increased, though exact figures are not available.

In Oklahoma, the crop failure caused defalcation in taxes, which was responsible for the breaking down of county health service, while scarcity of food led to migration to larger centers of population, and especially to the oil fields. This increased the problems of the health departments.

The most marked effects were noted during the last 6 months of 1930 and the first 3 months of 1931. The incidence of typhoid fever was slightly greater in 1930 as compared to 1929, but decreased for 1931. Extensive educational and immunization campaigns were carried out.

Dysentery followed the same general course, some increase in 1930 and a marked decrease for 1931. Pellagra has shown a great and steady increase, 219 cases for 1929, 298 for 1930, and 441 for 1931. These figures are for 6 months of each year only, in order to make them fairly comparable with 1931. Reports from the psychiatric hospitals indicate an increase of nearly 20 per cent in the number of admissions of pellagrins for 1930 over 1929.

It is manifest that this paper gives an incomplete account of what has happened. The ultimate effects of the drought will not be known

until very much more complete studies have been made and a longer time has elapsed. Except for the intestinal outbreaks studied by Dr. Veldee, the general effects of the drought on health are those which have been recorded for ages in the literature. We will unquestionably derive beneficial effects through an arousing of general interest, the stimulation of health officers and public health workers, and the recognition of the disaster by Congress. Undoubtedly the final effect will be precautions to forestall similar disastrous results in the future.

REFERENCES

1. Haggai, 1: 11.
2. I Kings, 18: 41, 45.

How Old Is the Word "Antiseptic"?

WHILE the words " antiseptic " and " asepsis " seem to be modern expressions, we find " antiseptic " in medical literature in the middle of the 18th century. It was also commonly used by the laymen and we find the following good advice in the publication, *Gentleman's Magazine* (1751): " Myrrh is twelve times more antiseptic than sea salt." Moreover I note the word antiseptic defined in St. Blancard's lexicon (1777) as follows: " Antiseptica, sunt remedia interna et externa, quae putridini resistunt."

There is a very interesting letter by George Foster, October 13, 1791 (Herrig's Archiv. Bd. 93. S. 41), wherein he describes treatment during an illness, " I had no desire to eat, etc., all the symptoms of a general breakdown. Drank quantities of vitrol acid and ate kraut conserve. In short, I was kept antiseptic and after a few days I became better. I now felt hollow and empty and very weak on my legs."

The kraut conserve was believed to be antiscorbutic. Chlorine and its combinations, sodium chloride and chloride of lime, were known as strong antiseptics through Semmelweis, especially in Wien and Budapest. Iodine later first became pushed to the foreground.

In Lister's time a number of antiseptics were used, for instance, alcohol and glycerine.

The surgeons of that time almost without exception used antiseptics with the idea of making decomposition harmless. Semmelweis, who used antiseptics on the hands, the main carrier of infection, to prevent infection, was one exception. " You should work with clean hands! " said Semmelweis, while Fleetwood Churchill said, " A gentleman's hands *are* clean " (E. Ebstein, The use of gloves in obstetrics in the year 1758. *Monatschr. f. Geburtsh. u. Gynäk.*, 79: 39, 1927).

Lister's teachings found little sympathy in England. They explained that the Germans are known as dirty people, therefore antiseptics might be necessary there, but in England they are superfluous.

It was not necessary in England to demand the cleaning and disinfection of the finger nails because a *gentleman* cleans his finger nails in his sleeping room.—Dr. Erick Ebstein, Leipzig, *München. med. Wchnschr.*, 76: 2168, 1929.

The 1930-1931 Drought and Its Effect Upon Public Water Supply*

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THE 1930 drought has dramatized as never before the need of safe, adequate, palatable, public water supplies. The widespread interest of the general public in the drought, the suffering it caused, the financial loss to those living in farming and rural areas, the anxiety of water works men and those in industries dependent upon water, all have been factors making for more adequate water supplies and for more completely equipped and better operated water filtration plants.

This drought and the disastrous flood over the Mississippi watershed in 1927 have acted so to accentuate public health work in the mind of the everyday person that public health machinery in all the states lying within the zone of these catastrophes is now far more efficient than it was 5 years ago.

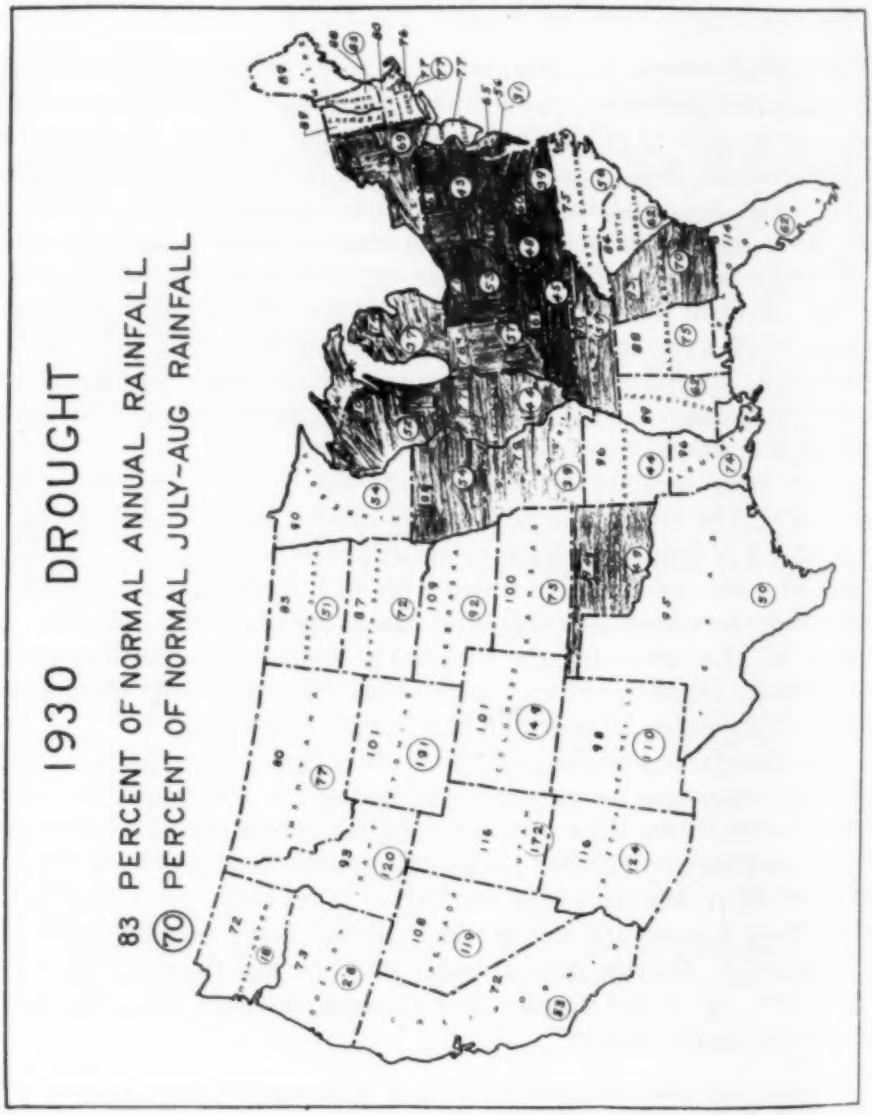
Each state sanitary engineer in the sorely distressed states has summed up the conditions which have existed in 1930 and to April, 1931, and it is from these supervisors of public water supply and sanitation who are constantly in touch with such conditions all over their states that the material in this brief summary has been obtained. In each of the affected states, the Division of Sanitary Engineering of the State Health Department was able to lend immediate help when water supply emergencies arose in the cities over their state.

The gigantic size of the problem is difficult to realize but some definite conception can be gained by picturing the states of Maryland, Pennsylvania, Ohio, West Virginia, Virginia, and Kentucky which embrace a territory of 200,000 square miles, and imagining water standing 2 feet deep over this entire territory. That is the amount of water which these 6 states did not get in 1930 and hence was not available for vegetation, streams, ground water supplies, and the manifold other water uses. Is it any wonder that emergencies were created such as were never known before?

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

These 6 states—Maryland, Virginia, Pennsylvania, West Virginia, Ohio and Kentucky—according to Prof. Floyd Nagler of Iowa, who summarized the drought situation in Iowa before the Iowa Water Works Conference in 1931, had approximately 60 per cent only of the normal annual rainfall and they constituted the heart of the drought area where most severe conditions obtained.

Prof. Nagler prepared maps showing the percentages of normal precipitation for July and August, 1930, in some cases to run in the zone of 30 per cent and 40 per cent of normal. He emphasizes the



fact that the excessive evaporation rate produced by the high summer temperatures with extremely low rainfall was an additional factor in causing the unprecedented depletion of stored water supplies and the unusual depletion of shallow ground water supplies from which evaporation takes place by capillary action and transpiration.

Every state which has analyzed the present drought situation is now commenting upon the deficient ground water supply and the possibilities of trouble arising in the fall of 1931 from this shortage.

The drought experiences of these 6 states have been outlined at some length in the various state water works meetings and before the American Water Works Association convention at Pittsburgh in May. However, it may be of interest to look at the problem from the standpoint of the entire area, considering the different types of problems which arose, how they were met, what new angles of water supply have been stimulated, and note the aggregate effect of the whole on public health.

Before considering the drainage basins of the Ohio and Potomac Rivers where lay the heart of the drought, we shall look for a minute at the fringe of states surrounding these, where drought conditions had to be met also.

CONDITIONS IN FRINGE OF MAIN DROUGHT AREA FOR 1930 AND FOR JULY–AUGUST

New York—Percentage of normal annual rainfall, 82; July–August, 69. Holmquist reports 65 public water supplies seriously affected by the drought, and several cities taking action to obtain permanent, enlarged water supplies. Rural supplies of thousands of farmers failed and they had to take their stock miles for water. Three hundred and seventy-eight water works managements were warned of a possible drought in 1931 on account of the sorely depleted ground water.

Illinois—Percentage of normal annual rainfall, 77; July–August, 44. Ferguson had 15 communities affected where emergency measures were adopted. So eager were farmers for rain that even the first run-off from roofs laden with dust was directed into the cisterns.

Michigan—Percentage of normal annual rainfall, 74; July–August, 37. Rich reports no real suffering, but the ground water levels were lowered.

Wisconsin—Percentage of normal annual rainfall, 82; July–August, 52. Warwick states that streams and lakes were low with luxuriant algal growths, causing widespread tastes and odors.

Indiana—Percentage of normal annual rainfall, 76; July–August, 57. Finch says that the state experienced troubles but escaped alarming water supply deficiencies.

Iowa—Percentage of normal annual rainfall, 81; July–August, 54. Wieters advises that Iowa had many cities seriously embarrassed, but no complete failures—ground waters down to low ebb in some cases.

Missouri—Percentage of normal annual rainfall, 79; July–August, 39. John-

son advises that many supplies were so depleted that supplementary sources were drawn upon. Few cities were actually short of water.

Oklahoma—Percentage of normal annual rainfall, 94; July–August, 49. Darcey claims that no municipal supplies failed completely. However, taste and odor troubles in surface water supplies were so intense that citizens would not use the public supplies. Old wells, springs, and cisterns were resorted to, resulting in a great increase in the number of dysentery cases throughout the state. Twelve cities have adopted ammonia-chlorine control of taste since January, 1931.

Tennessee—Percentage of normal annual rainfall, 80; July–August, 59. Morton reports considerable trouble occasioned in some 13 cities and towns when springs and wells failed. Uses of water were restricted and the chlorination of emergency water supplies practised.

Georgia—Percentage of normal annual rainfall, 93; July–August, 70. Clarkson states that 8 cities found it necessary to develop emergency water supplies. Much permanent improvement has been obtained in construction and operation of water purification plants.

THE HEART OF THE DROUGHT AREA

The heart of the drought area of 1930–1931, where the outstanding difficulties with respect to public water supplies were encountered, lay on the watersheds of the Ohio and Potomac Rivers for the most part. The percentages of normal rainfall in 1930 were:

RAINFALL JULY–AUGUST, 1930

		Percentage of Normal
Pennsylvania	Annual	68
	Jul.–Aug.	43
Maryland	Annual	56
	Jul.–Aug.	31
West Virginia	Annual	59
	Jul.–Aug.	48
Ohio	Annual	71
	Jul.–Aug.	53
Virginia	Annual	60
	Jul.–Aug.	39
Kentucky	Annual	61
	Jul.–Aug.	45

It will be of interest to start at the upper state in the Ohio River drainage basin—Pennsylvania—and to point to some of the outstanding types of difficulties found in this 6-state territory, covering the major parts of the Ohio River-Potomac River watershed.

PENNSYLVANIA

Public health work has been stimulated in this state on account of the drought. The Secretary of Health, Theodore B. Appel, M.D., dispatched Pennsylvania's 5 completely equipped automobile laboratories, which are usually used for field stream pollution investigations, into all parts of the state to assist cities, towns, and rural communities in obtaining safe water supplies. These started their work in July,

and in the next critical 6-months period, 5,000 public and private water supplies were examined in 40 counties. Federal aid was made available in March, 1931, and the drought relief work still goes on.

In 48 counties in Pennsylvania, more than half of the state, 125 cities and towns were obliged to use auxiliary or emergency water supplies, or both. The State Health Department feels that the unusual effort to keep emergency water supplies safe was responsible for the fact that no increase in typhoid fever was noted.

Howard E. Moses, Assistant Chief Engineer, State Health Department, summing up some of the outstanding experiences in Pennsylvania in 1930, quotes Kendall Hoyt,[1] to the effect that 1930 by a small margin was drier than any previous extended drought, but those in 1881, 1894–1895, and 1910 were comparable in extent, rainfall deficiency, and attendant heat. The western portion of Pennsylvania suffered most, and L. S. Morgan, District Engineer in that area, summarizes a few of the chief water supply difficulties experienced in that section, the seat of the bituminous coal fields, for which the acid mine drainage, with little or no dilution, was largely responsible. He gives the following 7 effects of the highly acid, very hard water on filter plant operation:

1. Inadequate capacity of chemical feed equipment
2. Production of abnormal quantities of sludge
3. Inadequate sedimentation basin capacity
4. Inadequate facilities for sludge removal
5. Shortened filter runs
6. Increased cost of treatment
7. Failure to reduce hardness to satisfactory point to send into city mains

In one emergency at Apollo, Pa., the Kiskiminitas River, a highly acid stream, had to be used, and a hardness of 1,900 p.p.m. was recorded. The water plant was designed to handle only 300 p.p.m. hardness; hence the difficulties are obvious.

One particular feature was noted at Pittsburgh and other cities in Western Pennsylvania when the drought finally broke, namely, the inability to hold a residual chlorine in the water, for the chlorine demand far outstripped the range of the disinfection equipment. The characteristic "rivery" taste, one of mouldy, musty nature, started to prevail along the Ohio in Western Pennsylvania and continued down to the mouth of the river at Cairo, Ill. All efforts to counteract it failed, except possibly activated carbon treatment.

MARYLAND

This state experienced the greatest deficiency in rainfall of any state in the 1930 drought. The damage to agriculture was tremen-

dous, the State Agricultural Extension Service estimating a 40 million dollar loss to farmers with a fire loss of approximately ½ million dollars. Herds of cattle were often seen lying in groups in the fields exhausted by the lack of water. Maryland had 23.4 inches of rainfall as compared to a normal of 41.8 inches annually.

There were several outstanding results of this drought. The public water supply for 56,000 people living in towns and cities on the outskirts of Washington, D. C., failed entirely. These communities are supplied by the Washington Suburban Sanitary District, the water coming from storage and filter plants on the Anacostia River, consumption being approximately 3 m.g.d. In July these reservoirs were very low and late in the month connections were made with the District of Columbia water system.

Mention should be made of the observations of Tarbett and Frank, of the U. S. Public Health Service, that while the last dregs of water were being drained from the Anacostia storage system, with considerable algae present and the river very low, many families using this water experienced what appeared to be the same type of dysentery or intestinal disorder which prevailed later in West Virginia and in the Ohio River cities of Louisville and Ashland, Ky., and Cincinnati and Portsmouth, O., when the Ohio was flushed out in November and December, 1930. While many families living in the fringe of towns about the District of Columbia had this trouble, there was no evidence of it in the District itself in July and it completely disappeared when the District of Columbia water supply was substituted.

Water Supplies Destroyed by Salt Water—Another notable effect upon water supplies located along streams discharging into coastal waters was the encroachment of the saline waters upstream. This was observed in Maryland, Pennsylvania, and Virginia, and caused the abandonment of certain public water supplies for domestic and drinking purposes.

Havre de Grace and Perry Point, Md., watched the salty waters diffuse up stream, increasing the salinity from 7 p.p.m. in May to 200 p.p.m. in September, reaching a maximum of 885 p.p.m. in December.

Chester, Pa., on the Delaware River, and certain Virginia cities also had their public water supplies affected in this same manner. The State of Pennsylvania eventually received an appropriation of $50,000 during the 1931 term of legislature to study further the salinity of the Delaware River and its possible future effect upon the public water supplies of Chester and Philadelphia.

Unusual Fish Mortality—The salt content in the Chesapeake Bay and its tributaries was greatly affected by the great drought of 1930.

Unusual fish mortality was reported in the Magothy and Severn Rivers and the Department of Zoölogy of University of Maryland made careful studies of it. Dead and dying fish appeared in great numbers, and the dying fish were observed swimming about breaking water with their mouths and pushing their heads upon shore, ordinarily an indication of oxygen deficiency or high pollution. These disturbances took place about November 5, and continued for about 2 weeks. The conclusions of the Department of Zoölogy were that the salt invasion was responsible for the fish mortality since there were no unusual conditions of pollution, temperature or oxygen content.

In connection with this it is of interest to note that during November and December, 1930, and January, 1931, similar effects on fish were observed in the Kanawha and Ohio Rivers at Charleston, W. Va., Ashland, Ky., and Portsmouth, O., which occurred when tastes in public water supplies were bad and outbreaks of intestinal disorder prevalent. The water in these streams may have contained some unusual chemical substance from decomposition products.

OHIO

Ohio suffered grievously in the southeastern sector. Cities depending upon storage saw the reservoirs entirely dry up and the state sanitary engineers took charge of the emergency relief work. Abandoned mines and drilled wells saved the day.

One of the relief measures in Southern Ohio was the authorization by the 1931 legislature of the expenditure of $10,000 for extending the scope of the "Seal of Safety" wells located strategically along the highways to serve both tourist and farmer. This work was to be done by the Sanitary Engineering Division of the State Health Department. Sixty-five wells are now being drilled at a cost of approximately $150 each. During March, 1931, a warning was sent out to all public water supply managements that 1931 had the appearance of a drought year so far as ground water supplies were concerned, for the level of the ground water had fallen from 3 to 7 feet and was still going down.

Ohio has many cities located on the Ohio River opposite the states of Pennsylvania, West Virginia, and Kentucky, and it will be of interest to note the types of weapons employed by the trained chemists in charge of modern filtration plants using the Ohio as the source of public water supply.

When the Ohio finally began to flow in late December, 1930, and January, 1931, the troubles predicted a month previous by the Ohio State Health Department engineers materialized. A musty, rivery, nauseating taste persisted in both raw and purified water despite all

efforts to remove it. Bellaire and Ironton, O., shifted over to excess lime as a disinfectant, discontinuing chlorination. Delaware, O., on a tributary, used potassium permanganate successfully for 3 days.

Warren, Marietta, East Liverpool, Pomeroy and Cincinnati, O., used the ammonia-chlorine process, which was successful in preventing phenolic tastes but did not overcome the disagreeable "rivery" taste which predominated. Great difficulty was encountered in maintaining a residual chlorine at Warren, on the Mahoning River, due to some unusual condition in the water—high organic content possibly. In one case 7 lb. per m.g. failed to show a trace of residual chlorine.

At certain other cities—Chesapeake, O., furnished water by Huntington, W. Va., and at Newcastle and South Pittsburgh, Pa.—the use of activated carbon was successful in removing the rivery, musty taste. Approximately 50 lb. of Nuchar per m.g. were used. The treatment costs approximately $4 per m.g.

Ohio River Cities Experience Sickness—In a paper presented by F. H. Waring, Chief Engineer of the State Health Department of Ohio, before the Indiana Section A. W. W. A. in February, 1931, mention is made of the widespread complaint about the water in Cincinnati and the Ohio River cities of Ironton and Portsmouth because of objectionable tastes which were accompanied by an outbreak of so-called "intestinal influenza." Two theories were advanced by medical men: that a type of influenza prevailed affecting the intestinal tract; and that there was a toxic property in the river water by reason of the decomposition of organic substances of vegetable and animal origin.

Bacteriologically, the public water supplies where these intestinal disorders prevailed met the U. S. Treasury Standards of safety. The State Health Department has taken the stand that it does not know which theory is correct but such a situation warrants the expenditure of considerable funds by a city water department either to purchase or install equipment, or for the purchase and use of additional chemicals in the water treatment.

The result of the Ohio experience on the whole is that these Ohio River cities are now installing or considering the installation of ammonia-chlorine or activated carbon equipment in order that they may be able to cope with any type of tastes, drought or no drought. New ideas on water treatment have been evolved as a result of the drought and the practical remedies should be applied.

KENTUCKY

At the peak of the drought in Kentucky, one-third of the public water supplies of the state were forced to adopt emergency measures.

The far famed Kentucky blue grass section was scorched brown, and water became a very precious article. One might characterize the city water supplies of this section as "transported water supplies," for this limestone area depends upon storage reservoirs and these had become bone dry.

Shelbyville, 30 miles from Louisville, drank the Louisville water. It was hauled in by means of sixteen 10,000 gal. railroad tank cars daily from August 7, 1930, to February, 1931.

Richmond, after using up 245 m.g. of stored water and a private lake with emergency chlorination, began shipping 210,000 gal. of water daily on the L. & N. Railroad from Valley View.

Lexington was threatened in September when the 1,640 m.g. storage became low, and rushed to completion a 6½ mile emergency line to the Kentucky River which was completed in record time.

Louisville had an ample supply of water but was bothered by an unusual biological condition. The Ohio River, though green and clear, had an algal and plankton content of many thousands per c.c. instead of hundreds, as is normally the case. Despite all types of treatment the water remained unpalatable and was not satisfactory as a beverage.

The significant public health note in Kentucky during the drought was the action of the State Health Department in sending out antityphoid vaccine to approximately 1 million people. People were drinking water from all sorts of places and therefore this wholesale immunization was deemed advisable. Nearly ¾ million people were thus protected.

In December, 1930, and January, 1931, came a widespread epidemic of intestinal disorders in Louisville which was investigated by M. V. Veldee, M.D., of the U. S. Public Health Service, who had earlier reported upon an intestinal outbreak of rather large proportions at Charleston, W. Va., on a tributary of the Ohio River.

WEST VIRGINIA

Next to Maryland, West Virginia had the least rainfall of any state, 59 per cent of the normal. The wheels of industry were stopped in some sections by complete disappearance of streams. The Tygart Valley River in the northern part of the state, 1,340 square miles drainage area, was reduced to a flow of 1.5 cu. ft. per second.

The Elk River, 1,550 square miles drainage area, which is the source of water supply for the capitol city, Charleston, dried up for practical purposes and an unprecedented case of intense pollution and a serious public water supply emergency were created by reason of the Elk River flowing up stream carrying gross sewage and garbage pollution from its junction point with the canalized Kanawha River.

Charleston, with a privately owned water supply, tried all resources to get rid of the objectionable, nauseating odor, but to no avail. The bacteriological counts of the filtered water were satisfactory but the sewage and garbage, organic pollution was too great, producing a nauseating taste and odor which persisted all summer, reaching its worst in late October, 1930.

Early in November 5,000 to 8,000 people living in the city of Charleston suffered from temporary intestinal disorders characterized by a sudden onset, pain in the region of the stomach, usually nausea or vomiting or both, and followed by diarrhea of varying severity. People flocked to bottled waters and miscellaneous springs and wells. The state health authorities were assisted in their investigations by R. E. Tarbett, Sanitary Engineer, and M. V. Veldee, M.D., epidemiologist of the U. S. Public Health Service. The following conclusions were reached:

1. Too gross pollution existed at the regular water intake due to back flow from the sewage zone.
2. The raw water in the stream had zero dissolved oxygen at times.
3. The raw water count was excessive—200,000 per c.c.
4. The *B. coli* content of 10,000 per c.c. was too high for safety.
5. The organic matter, algae and protozoa were extremely high, calling for a 20 lb. per m.g. chlorine dosage to supply the chlorine demand.

An emergency water intake in the Kanawha River was proposed and on November 11 approved, and construction started, work being completed in January, 1931, just before the heavy rains came.

Intestinal disorders were also noted at another West Virginia city—Weston—where the raw water was grossly polluted due to heavy sewage concentration. Here also nauseating, musty odors and tastes prevailed. Another Ohio River city—Sistersville—gave a record of a large number of cases of intestinal disorder, coincident with the bad taste troubles in the late fall months.

With the Charleston, Weston, and Sistersville records of intestinal disorders of many thousand people in these 3 cities on file, and the epidemiological evidence indicating that it was in some way connected with the public water supplies—even though these were purified in modern plants and gave a safe bacteriological test—it would appear that research should be undertaken to show whether a heavy organic or algal load on a water supply may in any way affect the health of the consumers.

Stream pollution in West Virginia has been brought into the spotlight by these unusual experiences and the new State Water Commission, created by the legislature to handle these problems, is expected to

make some definite decisions which will limit sewage and industrial pollution and start a reclamation program.

VIRGINIA

The water supply conditions in Virginia called for continual alertness on the part of the Sanitary Engineering Division to cope with rapidly developing emergencies. The far famed and productive Shenandoah Valley lay parched and brown from May until December, with the rural communities suffering most from loss of crops. Eighteen cities and towns had to adopt emergency measures, and the records of the State Health Department show the following large amounts spent to get water:

COST OF VIRGINIA EMERGENCY WATER SUPPLIES

Newport News	$83,000
Front Royal	19,000
Harrisonburg	27,000
Bluefield	40,000
Staunton	8,000

The types of difficulties in Virginia were much like those developing in the limestone areas of Kentucky, for the territories are much the same, depending largely on impounded supplies in the mountains. Many emergency hypochlorite disinfection plants were set up and all emergency supplies were heavily treated with "H. T. H."

Chlorination of emergency supplies was one of the major means of protection. A unique means of relief was adopted at the Marine Base at Quantico, where salinity entered the picture. Quantico, supplied from Chapawansic Creek, saw this creek go lower and lower until the water works could only be operated intermittently. Then, barge service was commenced, filtered water being take on at Norfolk and Indian Head. The barges leaked salt water in some cases and entire loads that were too high in salinity had to be wasted. In tidewater, Virginia, the salt water diffused further up stream than ever known before—16 miles up the Potomac—and had a marked effect upon the aquatic life in the rivers. On the whole the section of Virginia suffering most lay between the Blue Ridge Mountains and the Allegheny and here the major amount of emergency relief work had to be done.

SUMMARY OF TYPES OF TROUBLES

Reduced Stream Pollution—One outstanding and persistent trouble in all affected states was the prodigious algal growth in streams and storage basins with the accompanying organic load and the resulting nauseating tastes and odors. In many cases there were no known means of relieving the condition.

The series of 53 artificial lakes in the Ohio River between Pittsburgh, Pa., and Cairo, Ill., into which sewage and industrial wastes poured, and from which there

was almost no flow except by displacement by polluted water, constituted basins where pollution progressively increased throughout the summer months. It is no wonder that it was difficult to treat water from these basins so as to make it potable even in modern purification plants.

The " Great Drought " has warned the people of the Ohio drainage basin that pollution of their river has reached the limit and that the coöperative principle successfully carried out by the 11 states on the basin in eliminating phenol, a damaging trade waste, should be extended to other industrial and to sewage wastes. The Interstate Stream Conservation Agreement of 1924 should without delay be enlarged in scope to reduce stream pollution on this great waterway.

Taste and Odor Control—Research work has been stimulated by the drought along the lines of taste and odor control, and the principles being developed in the laboratory were given an extensive application over the eastern part of the United States. Oklahoma lists 12 cities which have adopted ammonia chlorine control of tastes and odors since January, 1931. Ohio, West Virginia, and Pennsylvania now have many plants equipped with both ammonia-chlorine and activated carbon treatment units and it seems likely that these processes will soon be incorporated into routine plant operation nearly everywhere.

Intestinal Disorders Show Need for Further Research on Heavy Organic Loads with Algae—The several instances over this drought area where definite intestinal disorders have appeared associated with bad tastes and heavy organic loads cannot be overlooked. The towns and cities around Washington, D. C.; Charleston, Weston and Sistersville, W. Va.; Ashland and Louisville, Ky.; and Portsmouth, Ironton and Cincinnati, O.; all testify that something unusual in the way of intestinal disorders appeared during the drought, and it may be that algae in heavy concentrations with the resulting organic load may be a factor in bringing about these troubles.

It is significant that Charleston, W. Va., on the Kanawha River, where the organic load on raw water was heaviest, as evidenced by a chlorine demand of approximately 20 lb. per m.g., experienced the most severe type of intestinal disorders, while Ohio River cities where there had not been the opportunity for such tremendous putrefaction of organic matter were not so severely affected. An unusually close check was maintained at Charleston upon the bacteriological quality of the effluent so that a water meeting the U. S. Treasury Standards for safety was delivered at all times.

R. F. Goudey,[3] Sanitary Engineer, Department of Water and Power, Los Angeles, Calif., in discussing sewage reclamation in the Los Angeles Metropolitan area, mentioned the possibilities of using purified sewage as a source of public water supply in the following words:

" When sewage has been completely treated in a super-activated sludge plant and is then put through the entire gauntlet of water purification, why should it not be used directly for domestic purposes? Why should its reinstated purity be lost by using the water for *less noble* purpose? "

When we have these unexplained evidences of a severe intestinal irritant as evidenced in the cities of the Ohio River basin during the drought, we should find the answer before the adoption of reclaimed sewage for drinking purposes.

Salt Water Invasion of Water Supplies—Public water supplies on the coastal rivers in Pennsylvania, Maryland, and Virginia were affected by the diffusion of salt water up stream. On the Susquehanna it came up 30 miles and on the Potomac

16 miles. Certain water supplies in Maryland had to be discontinued on account of the salt content. In Pennsylvania the legislature made available $50,000 for a complete study of this phenomenon, since it menaced the public water supplies of Chester and Philadelphia. The salt water invasion had a secondary effect, according to investigations by the Department of Zoölogy of the University of Maryland, their studies indicating that the high saline content in the Magothy and Severn Rivers was responsible for the very extensive death of fish.

Ground Water Lowered—Ground water supplies have been lowered throughout the drought area and no recovery has been made to date in 1931. Well and spring supplies will probably fail in sections of all 6 drought states during 1931, since the water table is several feet lower than at the corresponding time of 1930. This condition in West Virginia had developed increased mineralization in deep well supplies, and iron particularly is giving much trouble.

In Ohio the threatened lowering of ground water has been responsible for the action of the 1931 legislature in making available $10,000 to drill and equip 65 wells in Southern Ohio to supply farmers and tourists with safe drinking water.

Typhoid and Intestinal Disorders—There was no large increase in typhoid fever in this area in 1930 such as was observed in the 1925 dry period. Possibly the wholesale typhoid immunization indulged in because citizens wished protection was one reason. Then too, state sanitary engineering divisions were unusually active in supervising the chlorination of emergency water supplies.

Stream pollution control work and its needs have been emphasized and the program may be expected to go ahead more speedily. Taste and odor control by treatment with ammonia-chlorine and activated carbon has received a strong stimulus and it appears likely that processes until now considered in the research stage will move rapidly to the field of practical application.

It has been reasonably well proved that too great an organic and putrefactive load of pollution on a raw water supply will bring about conditions which may cause intestinal disturbances among the users even though it meets the strict bacteriological qualifications for a safe public water supply.

The aggregate and final effect of the 1930 drought on public health will probably be beneficial. The general public have received a dramatic portrayal of the worth of safe, palatable, adequate public water supplies.

REFERENCES

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DISCUSSION

H. E. MOSES

Assistant Chief Engineer, Pennsylvania Department of Health, Harrisburg, Pa.

MR. TISDALE in his excellent paper has graphically portrayed the desperate condition in which public water works found themselves in the affected area. Merely to procure a water supply of any sort to replace or supplement those which had failed or dwindled to the vanishing point taxed the ingenuity and resources of the water works officials. Frequently, the ordinary supplies and the emergency ones were unpalatable. Conservation measures entailed rationing of the public supply in extreme cases.

As a consequence, the public resorted to the use of miscellaneous supplies secured where possible and without due regard to their safety. A serious health problem thus arose, entirely distinct from the necessity of rendering safe the public supplies.

In Pennsylvania, a measure designed to meet this condition was instituted by the Secretary of Health, who kept 5 mobile laboratories in the field from August, 1930, to September, 1931, except for the mid-winter months. From March, 1931, federal aid was given. Each unit was in charge of a sanitary engineer, the remaining personnel comprising a bacteriologist and laboratory helper and 3 health officers. The service was free to anyone desiring it. Work was principally confined to the rural areas, although upon occasion examination was made of public supplies, especially where emergencies occurred. At one place where the public supply was in serious trouble, the townspeople drove far from town to secure water and here nearly 800 samples were collected over a 20 mile area. At its conclusion this work had been carried on in 44 counties, and nearly 23,000 water supplies had been examined.

Perhaps the drought was needed as a lesson to the water works fraternity and public health engineer. We have become so accustomed to thinking with rather smug satisfaction that our water supplies in general are safe, adequate, and mostly palatable, that some sharp lesson is required to show the narrow margin which really exists between such a state and one where the ordinary routine is endangered and all the potentialities engendered by emergencies spring into being. That the affected area was not visited by a marked increase in water-borne disease is a gratifying commentary on the extreme care with which the safeguarding of the innumerable water supplies which had to be used was carried out, many times under adverse conditions.

New methods of treatment of water supplies for the control of odors and tastes probably advanced, under stress of immediate needs, far more rapidly than would ordinarily be expected. What usually would require months and perhaps years to accomplish has happened over night because of the urgent need of some means of producing water fit to drink. At the close of 1930, 17 water works in Pennsylvania had installed the ammonia-chlorine process, and other installations have since been made. Activated carbon has been tried out and in at least one instance adopted as a regular plant process when needed.

As the result of failure of impounded supplies, the water works engineer is asking the pertinent question as to whether we need to revise our present-day basic design figures as to storage.

Naturally where large impounded supplies were used there was a distinct lag in feeling the effects of the drought; this in distinction to the smaller supplies which were early in trouble. In Pennsylvania in the case of 2 large water works with immense storage reservoirs in use, serious trouble was not encountered until the end of 1930, whereas the smaller supplies were depleted in August. There is one instance of a 3 billion gallon reservoir drawn down to 19 per cent of its effective storage, and there are still other instances of where very large impounding reservoirs were practically emptied. Consequently, it is no wonder that the engineers of these water companies are giving consideration to the matter of the possible need of additional storage.

Pertinent to this subject is an article by Kendall K. Hoyt [1] where in a discussion of data compiled by the U. S. Geological Survey on the 1930–1931 drought he says:

Droughts Recur—Studies of past rainfall and stream-flow records show clearly that droughts are recurrent and that another drought of 1930 severity is almost mathematically certain to happen again. Notwithstanding opinions of old residents to the contrary, the 1930 drought was not unparalleled. It was the severest in 50 years of definite record, but three others during this same period were comparable in extent, rainfall deficiency, and attendant heat: those of 1881, 1894–1895 and 1910, fifteen years apart on the average. The 1930 drought, however, was of exceptional effect not only because of the economic depression but also because the demand and uses for water have increased since the drought of 1910.

Many interesting problems have arisen due to the adverse conditions, some of which have been mentioned by Mr. Tisdale. One that seems to have been rather general was the changes which occurred in the character of the water, particularly noticeable in Pennsylvania on the Allegheny and Monongahela Rivers. L. S. Morgan, District Engineer of the Pennsylvania Department of Health, stationed at Pittsburgh, describes some of the conditions prevalent at that time as follows:

The Monongahela receives considerable mine drainage and is usually acid down to Pittsburgh and the water plants along this stream have been accustomed to handling water of that type. However, this condition changed and while the river was highly acid to a point about 25 miles above its mouth, down stream from this point the acidity was gradually decreasing until it was actually alkaline near its mouth during the extreme low flow period. This gradual reduction was not due to the inflow of alkaline diluting water from tributaries, but was caused by neutralization of the acidity, principally at industrial plants, of large volumes of the river water and the return of this alkaline water to this stream.

The increased cost of treatment was a serious factor and was due principally to the amount of chemicals used. At one water works as much as 27 tons of soda ash and 12 tons of lime a day were required to soften 14 million gallons of water. Here the cost of chemicals alone for 1930 was more than double that for any previous year. This plant has constructed a carbonization plant and will utilize the carbon dioxide generated by burning natural gas. Other examples might be cited, but this one alone is significant of the changed conditions which had to be met by water works operators.

The failure of underground water supplies has directed attention as perhaps nothing before to ground water conditions. Seemingly definite information is hard to secure concerning the replenishment of underground supplies. The general impression seems to exist that wells and springs have not returned to normal and the statement has been made by John C. Hoyt, of the U. S. Geological Survey, that while the surface streams may be expected to be restored shortly, it is anticipated that a much longer time will be needed before the wells and springs come back to normal. It has been our observation in Pennsylvania, without making a definite and detailed study, that the underground supplies have not been replenished although they are not so seriously affected as during the 1930 drought.

One interesting case was noted which might have some significance. A limestone quarry was visited during August of this year. This has a depth of possibly 60 feet and when seen was quite dry. The department's engineer was told that this quarry had been dry for the last 18 months, whereas formerly it had been necessary to pump water at a rate at times as high as 500 gallons per minute.

It is not particularly relevant in this discussion to refer to other phases of the drought, such as the effect on crops, but because of the relation between forest cover and runoff, it is at least interesting to mention the effect which the drought had in the forests. One brief reference to this will serve to illustrate this phase of the

problem and is quoted from the *Service Letter*, Pennsylvania Department of Forests and Waters, April 16, 1931, as follows:

LOSS IN TREE GROWTH FROM THE 1930 DROUGHT

Measurements and observations taken on the Mont Alto and Michaux State Forests in Franklin County indicate that the tree growth of 1930 was 25 per cent less than that of 1929, as a result of the drought. White pine showed a loss in diameter growth of 28 per cent. Similar conditions were observed in the Rothrock District in Huntingdon County and in the Penn District in Mifflin and Centre Counties.

On the basis of an average growth of 40 cubic feet per acre per year, the 1,429,135 acres of State Forests suffered a loss of 14,290,000 cubic feet or 158,700 cords. On the basis of an average growth of 25 cubic feet per acre per year, the 13,206,000 acres of forest land in the State suffered a loss of 82,538,000 cubic feet. In addition, thousands of forest tree seedlings have died as the result of the drought.

REFERENCE

1. *Eng. News Rec.*, June 4, 1931.

Who Are the Superior?

AT the same time that I do not consider the proofs of the inferiority of the rapidly reproducing groups satisfactory, I do not consider the proofs of the hereditary superiority of the socially successful satisfactory. Social success, in which I include economic success, is proof only of individual adaptation to the conditions necessary to secure the type of success which happens to be valued most highly by the group at a given time. It is not proof of an all-round ability in the person who succeeds, nor is it proof of the possession of qualities which will contribute largely to the development of a progressively improving society. As a matter of fact, many people who make a social success do so because they are thick-skinned and lack the imagination to see the ways in which their success will react adversely upon the welfare of others and upon the organization of community life. There is nothing inherent in the nature of social success to ensure that the person who attains it will also possess the finer human qualities which will add to the fullness and richness of our life.

It would not be at all difficult for any one who knows a number of successful people to pick out several of them, perhaps one-tenth to one-fourth, who owe their success largely to the qualities which they share in common with the bully, the prize fighter, the ward heeler, and the fox.—Warren S. Thompson, *Population Problems*, 1930, p. 355.

Sewage Disposal Difficulties Due to Drought*

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IN considering the difficulties occasioned by a drought, in relation to sewage disposal, one has an entirely different point of view from that of the water works man with a surface supply who is likewise in trouble from the same general cause. In a given situation there normally may be sufficient water in a stream to furnish an adequate water supply and also sufficient dilution for the sewage of the community as it is discharged to the stream, either with or without treatment. At times of low water stage, except when the raw water supply is affected by upstream sewage discharges, the difficulties in connection with the disposal of sewage will arise before a water shortage makes itself felt. In fact there may be serious difficulties in connection with the disposal of sewage with no shortage of water for water supply purposes.

On the surface at least, the effects of a drought, in a given case, may serve only to create conditions in a relatively unpolluted stream which are similar to grossly polluted conditions frequently occurring in a nearby stream. For that reason, a drought does not present the unusual circumstances in relation to sewage disposal that it does with respect to water supply.

In the drought area during the first season of the 1930–1931 drought, lack of normal surface run-off caused low stream stages. During the second season the stream flow stages were further affected by failure of the ground water resources which are normally available for maintaining minimum stream flows in the absence of surface run-off.

Table I taken from *Engineering News-Record*[1] indicates the degree of shortage during 1930 in certain major Ohio streams. Data presented on 5 West Virginia streams[2] indicated essentially the same stream flow conditions to be prevalent in that state.

It is obvious, if the flow in a stream is barely adequate under ordinary circumstances to furnish proper dilution for the sewage of a community, that if the flow falls to only 5 per cent of normal, for example,

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

TABLE I

(ENR April 16, 1931)

FLOW IN CERTAIN OHIO STREAMS DURING DROUGHT

	Hocking River at Athens, O. 944 sq. mi.			Muskingum River at McConnelsville, O. 7,410 sq. mi.			Scioto River at Chillicothe, O. 3,850 sq. mi.		
	Actual Flow, Sec.-Ft.	Normal Flow, Sec.-Ft.	Per Cent	Actual Flow, Sec.-Ft.	Normal Flow, Sec.-Ft.	Per Cent	Actual Flow, Sec.-Ft.	Normal Flow, Sec.-Ft.	Per Cent
Oct., 1929	398	393	131	2,460	2,550	97	2,840	1,400	203
Nov., 1929	2,360	815	290	10,900	5,460	200	7,710	2,740	288
Dec., 1929	1,650	1,350	122	11,400	9,390	122	8,830	4,930	179
Jan., 1930	2,310	1,720	134	25,100	12,200	206	17,700	6,740	263
Feb., 1930	1,590	1,820	87	12,200	12,200	100	8,200	6,040	136
March, 1930	2,240	2,140	105	16,200	14,800	109	6,750	7,300	90
April, 1930	910	1,380	66	7,490	11,300	66	2,310	5,810	40
May, 1930	179	1,120	16	2,700	8,110	33	800	3,750	21
June, 1930	77.8	876	9	1,360	5,620	24	470	3,050	15
July, 1930	52.2	487	11	711	3,870	18	303	1,510	20
Aug., 1930	39.6	439	9	494	2,190	23	214	937	23
Sept., 1930	44.8	354	13	631	2,720	23	233	1,060	22
Oct., 1930	36.1	303	12	625	2,550	25	225	1,400	16
Nov., 1930	51.4	815	6	784	5,460	14	254	2,740	9.3
Dec., 1930	64.5	1,350	5	981	9,390	10	267	4,930	5.4

the otherwise relatively unpolluted stream will become grossly polluted.

Such conditions undoubtedly existed at many points in each of the states within the drought stricken area but with more serious effects in certain localities than others. An analysis of the effect of drought in relation to sewage disposal may indicate that under certain circumstances a drought may be helpful rather than detrimental to stream conditions. Further than that, circumstances so alter cases with respect to stream pollution problems that specific instances of exceptions to broad principles may always be found.

In the present discussion, no attempt will be made to describe specific instances of difficulties encountered except in cases where such an instance may serve as an example of the circumstances being outlined. Instead, the writer will present briefly the general circumstances under which difficulties occur, the broad effect of the difficulties, and the general remedial measures which would be helpful if they could be applied.

EFFECT ON SEWAGE DISPOSAL

Outside of those conditions common to all streams overloaded with sewage, the low river stages accompanying a drought are responsible in many cities for exposed sewer outlets with accompanying local nui-

sances. Under normal circumstances such conditions would not be tolerated, but under drought conditions which everyone feels may be terminated at any time they are allowed to continue.

Low stream stages also expose sludge deposits with attendant odors and unsightliness.

On the other hand, where cities have sewage treatment works drought conditions may be helpful so far as plant efficiencies are concerned. In the first place, the sewage becomes concentrated and, up to a certain point, more amenable to treatment. This concentration primarily results from lowering of ground water tables with consequent lessened infiltration into sewers. In communities where an acute water shortage exists the sewage is even further concentrated because of economy of water consumption. Increased plant efficiencies are also obtained in the case of works treating combined sewage because of less frequent disturbances due to storm water.

Sludge drying is also facilitated under drought conditions. In a properly designed and adequate plant this may not be a material factor but in cases where sludge digestion and drying capacities are inadequate the lengthened drying season may be exceedingly helpful. During the winter of 1930, the weather in Indiana was such that it was possible to dry sludge on open beds during the entire season.

EFFECT ON STREAM CONDITIONS

In first considering the result of low stream flows attendant upon a drought, it would not be expected that benefits would accrue because of the limited amount of water available for dilution. In general, however, stream conditions often are improved if the stream is considered as a whole.

In the first place, streams which in normal years may be deep, under drought conditions become shallow and partake of the more favorable self improvement characteristics of small streams. For a number of reasons small shallow streams correct pollutional conditions much more quickly than deeper ones. There is more opportunity for surface absorption of oxygen than in deeper ones, since in such streams the water is exposed to the air in thin sheets with the result that there is more exposed area in relation to the total volume of water. Under such circumstances the direct effect of the actinic rays of the sun is also more pronounced.[4]

Under drought conditions stream turbidities usually are low since there are no rains sufficient to carry in surface wash. This latter circumstance occurs more readily after the drought has persisted for some time in that due to dry soil conditions very heavy rains often do

not cause turbid streams. Such low turbidities favor the prolific development of algae. Of particular interest in this connection is the prevalence of algae capable of photo-synthesis.

In certain shallow Indiana streams over 300 per cent saturation of dissolved oxygen has been found on sunny days. Certainly such conditions assist materially in improving stream conditions. Of course, in normal years excessive dissolved oxygen content may be expected on sunny days, but the ratio of bright to cloudy days certainly is increased under drought conditions. While, from the water purification man's point of view, such algal conditions are not considered an unmixed blessing, nevertheless on a stream not used as a source of water supply such conditions are helpful in enabling the stream to return more quickly to its natural condition after receiving a pollutional load.

Diminished flows in many streams result in the formation of alternate pools and riffles, the pools affording opportunity for sedimentation and the riffles for surface absorption of oxygen. Again the formation of such pools may not be without its disadvantages since very offensive conditions with serious local odor nuisances may be produced by the decomposing sludge in them. Nevertheless if the whole stream is considered, in many cases conditions may be found to be better with the low flow. Even then the benefit of improved conditions may be lost if a sudden freshet quickly washes out the sludge which has accumulated in the pools over a period of months. Under such circumstances water supplies, not normally greatly affected by the discharge of sewage upstream, may be seriously jeopardized.

For the purpose of illustration, data secured during the course of a stream improvement survey of White River between Anderson and Muncie, Ind.,[5] are presented in Table II. A review of these data indicates that the concentration of *B. Coli* at the Anderson intake was much lower during the summers of 1925 and 1930, both drought years, than during 1926, which more nearly represented normal conditions.

During drought years, due to diminished flows, less oxygen is available in the streams as they reach points of sewage discharge. This condition is further aggravated by the fact that the temperature of water in shallow streams may become extremely high, with consequent lowering of capacity for oxygen absorption. While there are no compensating factors for the oxygen deficit, nevertheless the smaller stream flow results in increased concentration of organic matter in the stream. As observed by Streeter[4] and others, the rate of self purification of a stream is markedly accelerated in stretches where the concentration of organic material is highest. In other words, the rate of self improvement is proportional to the concentration of organic material.

TABLE II

B. Coli CONCENTRATION IN WHITE RIVER, MUNCIE TO ANDERSON

Period	Distance Below Muncie Intake Miles	Number of Days Sampled	*B. Coli** per c.c.	Remarks
1925				
July, Aug., Sept.	0	17	20	Extremely dry season with very
	9		9,000	low stream flow
	22		49	Anderson Intake
Oct., Nov., Dec.	0	10	10	
	9		1,000	
	22		275	Anderson Intake
1926				
Jan., Feb., March	0	6	7	
	9		750	
	22		400	Anderson Intake
Apr., May, June	0	12	20	
	9		2,200	
	14		300	
	16		150	
	22		60	Anderson Intake
July, Aug., Sept.	0	11	31	Normal season
	9		3,000	
	14		300	
	16		325	
	22		90	Anderson Intake
1930				
Sept., October	0	3	4	Extremely low stream flow under
	9	3	67,000	conditions of extreme drought
	14	3	400	
	16	3	100	
	22	4	30	Anderson Intake

* *B. Coli* Determinations 1925–1926 by Indianapolis Water Company—10 portions each dilution, parallel planting on Brilliant Green.
B. Coli Determinations 1930 by Indiana State Board of Health—1 portion each dilution, presumptive only.

In summarizing it may be said that even though theoretically there are advantages to be attained through low stream flows, predictions as to the actual occurrence of such benefits can be made only when certain definite circumstances are considered. This is the case since there may be improvements at one point on a stream, while at other points a corresponding increase of undesirable features may be noted.

Perhaps the best example of what may happen due to diminished stream flow may be seen in the case of Charleston, W. Va.[2] This city is located at the confluence of Elk and Kanawha Rivers. The

Kanawha is the larger and is canalized. The water supply intake is located in Elk River at least 1¼ miles above the junction. Downstream from the intake on the Elk, the city is said to have maintained a garbage dump. The municipal sewers discharge into both the Kanawha and the Elk but none above the intake.

As the river flow diminished during the summer of 1930, due to the dams in the Kanawha, the Kanawha and lower Elk became one great septic pool. On July 24 the flow in the Elk became less than the draft placed upon the stream by the water works and consequently the water from the pool, containing the garbage dump and an accumulation of sewage, was drawn upstream to the intake. Very soon the dissolved oxygen of the raw water fell to zero and the 37° bacterial count rose to between 50,000 and 100,000 per c.c. with organisms of the *Coli-aerogenes* group demonstrated in 0.001 c.c. In addition other organic substances had built up to a concentration which made it impossible for the purification plant to produce palatable water although by careful treatment it was made safe—at least from a bacterial standpoint. The same general circumstances occurred at another major city in the drought area.

Low stream stages with consequent complications in relation to sewage disposal affect the general public welfare in many ways. Fish life is materially interfered with and in many cases is actually destroyed with attendant economic loss from the food standpoint to say nothing of the effect upon the activities of sportsmen. The use of streams for watering stock is materially interfered with. The water also is in some circumstances rendered unfit for industrial use. By the formation of pools with consequent accumulation of sludge, and in many other ways, drought conditions in streams result in extremely objectionable odors which materially injure the comfort of those living nearby. However the greatest detriment is the deleterious effect upon public health.

In the first place exposed sludge deposits and the like may result in an extreme fly nuisance. Milch cattle may wade in polluted streams and come out for milking with bits of scum and sludge adhering to the flanks and udders. If the cow is not prepared for milking with extreme care, this sewage material may find its way into the milk.

Of far more importance however are the difficulties experienced in connection with the operation of water purification plants. The outstanding example of such trouble occurred in connection with the Charleston, W. Va., water works. The circumstances there in the summer and fall of 1930 have been described but the direct effect upon plant operation was not touched upon. As has previously been indi-

cated it was possible to make the water safe from the bacterial standpoint by careful operation and heavy chlorination but nauseating tastes were experienced.

Prechlorination[5] at the rate of 4 p.p.m. assisted in reducing the bacterial load; copper sulphate applied every other day to the river reduced algal growths; aeration restored the dissolved oxygen to some extent but the resulting product was described as "vile." In further efforts to abate the tastes, superchlorination, pre-ammoniation, and the use of powdered activated carbon was practised with some alleviation but not correction of the tastes.

In spite of the fact that the water was demonstrated to have been bacterially safe, a city-wide outbreak of gastrointestinal troubles occurred. Inasmuch as the characteristics of the outbreak were typical of a water-borne epidemic, and the water was above suspicion from the bacterial standpoint, it was decided that the difficulty was probably of chemical origin and that the causative agent possibly was one or more of the end products of the excessive organic decomposition which had taken place in the water.

A similar outbreak occurred during the winter of 1930 in practically all cities taking water from Ohio River as far down stream as Louisville, Ky. In these cases the epidemic was usually city-wide and seemed to have been typical either of water-borne or so-called influenzal outbreaks. At the same time very objectionable "river tastes" were present in the water supplies drawn from this portion of the river. Conditions in Ohio River were somewhat similar to those experienced at Charleston in that the river is canalized and had been at pool stage for many months. While somewhat similar outbreaks of gastrointestinal disturbances were prevalent throughout the Ohio Valley, in cities drawing water from wells as well as from streams, M. V. Veldee, M.D., of the U. S. Public Health Service, made an epidemiological study of the outbreaks along Ohio and decided that they probably were water-borne, and possibly due to the heavy concentration of decomposing organic matter in the streams.

As in the case at Charleston, many different expedients were tried in an attempt to combat these tastes. Powdered activated carbon, pre-ammoniation, and other methods were employed at various plants with varying degrees of success.

While such tastes and odors of themselves probably have little direct effect upon public health unless they are associated with decomposition products capable of causing sickness, nevertheless, indirectly they may cause people to drink water from unknown sources which may be dangerous. Objectionable tastes may be attributed to the

use of chlorine, and for that reason in improperly controlled plants the use of the chemical might be discontinued or decreased in quantity, thus establishing conditions causative of water-borne disease.

Heavy burdens may also be placed upon purification plants because of a concentration of organic matter including bacteria. Such excessive concentrations may be caused directly by lack of dilution, or by a washout of organic material which has accumulated in the stream over many months. Back flow of sewage laden water in a manner similar to that at Charleston might quite easily cause a break in purification with attendant sickness.

Measures necessary to prevent such difficulties may be taken in relation to sewage treatment, water purification, or stream control.

In designing sewage treatment works liberal allowance should be made in the type and extent of treatment adopted in order to provide a margin of safety for unusual weather and stream conditions.

Treatment works should be carefully operated at all times but especially during low stream flows.

At such times under special circumstances the use of chlorine may afford some measure of relief, for reduction in biochemical oxygen demand results from sewage chlorination.

Chlorination of a sewage treatment plant effluent may also serve to delay decomposition in the receiving stream until a nearby tributary can supply diluting water. It may also serve to delay decomposition until critical down stream points have been passed.

The real solution to the problems discussed in this paper is more rain, or at least more water in our streams. In the present stage of our knowledge nothing can be done about the rainfall deficiencies but to a certain extent stream flow could be controlled. In this case the same remedy lies for increasing minimum flows as for controlling flood flows, namely, the construction of upstream storage reservoirs and the carrying out of reforestation programs wherever possible. If storage reservoirs were available flood flows could be decreased and minimum flows increased. The same results in a minor degree would be accomplished by reforestation.

Careful education of the public and officials by sanitary engineers and public health workers will be necessary before the latter expedients can be carried out.

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An Epidemiological Study of Suspected Water-borne Gastroenteritis*

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LATE in October, 1930, there developed among the inhabitants of Charleston, W. Va., an acute ailment involving the gastrointestinal tract. Without any prodromal symptoms the attacked individual suffered an acute disturbance in the alimentary canal, beginning usually as a sharp pain in the epigastrium with general abdominal discomfort, the severity varying a good deal with the individual. Nausea or vomiting or both soon followed. In the milder cases no further symptoms developed, though in the vast majority diarrhea ensued within a few hours. In the severe cases the diarrhea became an uncontrollable bowel action over a period of several hours. There were no known cases which developed bloody stools. The site of greatest irritation varied with the individual, so that in some vomiting was the most annoying symptom, in others abdominal cramps, and in yet others a diarrhea, while the more severe cases developed all the symptoms mentioned.

In relatively few instances was a physician consulted, so that clinical observations were limited. A few temperatures had been taken and these were practically normal in the robust adult, but usually slightly elevated in the aged, the enfeebled and in young children. One of the physicians interviewed had made one or two white counts and found them within the normal range.

The duration of the attacks rarely extended over three or four days, with the milder ones lasting only a few hours. With the subsidence of the symptoms the patient again felt entirely well, except for such general weakness as may follow the use of any strong purgative.

The writer investigated this outbreak on November 12 and 13 at which time very few new cases were developing. State health officials estimated that in Charleston's approximately 60,000 inhabitants there had been from 4,000 to 7,000 cases. There had been no deaths. A house-to-house inquiry was made of homes in two rather small areas of

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

the city; one being in an economically good section and the other in an economically poor section. The former reported 11.4 per cent of all persons canvassed as having been ill, while the economically poor section reported 18.7 per cent. This gives approximately 9,000 cases for the entire city.

No reports had come to the State Department of Health of cases occurring elsewhere in the state. The Kanawha County Health Officer had encountered no cases in that portion of the county beyond the city boundaries of Charleston. At the writer's request the County Health Officer talked over the telephone with practising physicians in those communities lying in the general vicinity of Charleston. Each physician stated that he had no such disease in his practice nor did he know of any in his community. Inquiry was made more particularly among those families living across the Kanawha River from Charleston. No cases had appeared among them.

The outbreak in Charleston soon abated and no further disturbance was encountered until near the first of January, when cases with exactly the same symptomatology began to appear in Huntington, W. Va., and Ashland, Ky. It was the opinion of the Health Officer and physicians of Ashland that the number of cases in that city began to decrease about January 10 so that at the time of the writer's visit on February 3 few if any cases remained. Many physicians in Ashland were interviewed and all gave the same clinical description which coincided with that already given for the Charleston cases.

Investigation revealed that residents of Ironton, O., had experienced the same ailment at approximately the same time as those of Ashland. Portsmouth, O., reported the same experience though apparently in a less severe form. Cases began to appear in Cincinnati about January 15 and rapidly increased in number, though it was apparent by February 1 that few new cases were developing. The exact number occurring in Cincinnati cannot be stated, as no systematic canvass was made and cases were not reported to the health department. However, in view of comments appearing in the press, conversations overheard in various meeting places, and the fact that personal conversations with many individuals in various economic positions revealed few who either had not suffered from the ailment themselves or had relatives or friends who had been afflicted, it must be concluded that a considerable percentage of the population was attacked, though it is believed this was not so great as in Charleston.

Complaints from Louisville, Ky., about January 25 indicated that that city was experiencing the same inconvenience.

A personal investigation was made in Hamilton, Dayton and Co-

lumbus, O., and Parkersburg, W. Va., without finding any evidence of a similar outbreak in these cities. Indirect information from Pomeroy, Marietta, Bellaire, Martin's Ferry and Steubenville, O., and Wheeling, W. Va., indicated that no cases had come to the attention of the officials in any of these cities. Similar information from a non-medical source was that cases were appearing in Sistersville, W. Va., about December 20, though this was not confirmed. The most striking illustration is that of Cincinnati and Norwood, O. The latter city, with a population of 33,000, is so situated as to be almost entirely surrounded by the city of Cincinnati. The available evidence indicated that numerous cases did occur in Cincinnati, but through a similar investigation in Norwood the writer was unable to find cases among that portion of the population which had had no direct contact with Cincinnati. A large portion of the working population of Norwood is employed in Cincinnati and among this group cases did occur.

Unfortunately a more detailed case investigation could not be made throughout the epidemic zone. Because of the relative mildness of the disease, cases were not referred to hospitals for treatment. For this same reason, and also because of the explosiveness of the outbreak, the physicians did not have time to make any clinical study of the cases. One visit to the physician or a request for advice over the telephone usually sufficed for the relatively small portion who sought medical attention. However the present epidemiological investigation was sufficiently detailed to outline the geographic distribution of the outbreak and provide evidence which appeared at that time to give a plausible explanation for the disease.

Approximately one-sixth of Charleston's population became ill in the brief period of 2 weeks. This indicates a rapid dissemination of the causative agent throughout the city, irrespective of economic, social or color barriers. The presence of so many cases within the city and the complete absence in the communities immediately surrounding further restricts the causative agent to some channel which did not extend beyond the city boundaries in the Charleston area; unless we are to assume that those persons living beyond the city possessed a peculiar immunity. However, the appearance approximately 2 months later in at least 6 Ohio River cities of an ailment which in all of its clinical manifestations corresponded with the Charleston cases makes it appear that the causative agent was contained in some vehicle which also was common to these latter cities, and further that this same vehicle was absent from the nearby cities of Norwood, Hamilton, Dayton, Columbus and Parkersburg. Immediately it is seen that any theory of an air-borne person to person route of infection becomes impossible.

Similarly milk and other foods are removed from suspicion. There remains but one possible avenue of communication which was common to all the inhabitants within any one individual affected city, at the same time common to all of the cities involved and not to those in which the outbreak failed to appear. This avenue of communication was the public water supply.

Charleston normally draws its water supply from the Elk River but for the period of the outbreak the water was largely from the Great Kanawha River. The Great Kanawha flows into the Ohio several miles above Huntington, W. Va. Aside from Charleston the only other cities known to have been involved in the outbreak use water from the Ohio, whereas cities located in the same general area but not using Ohio River water escaped. This even applied to Parkersburg, W. Va., which borders on the Ohio up-stream from the confluence with the Great Kanawha but which derives its drinking water from driven wells.

The natural assumption, therefore, is that the cause for this restricted epidemic was a bacterial infection of the gastrointestinal tract made possible by a let-down in the sanitary quality of the drinking water. However, there is no evidence to prove this.

TABLE I

THE MEAN MONTHLY *B. coli* INDICES PER 100 C.C. IN THE UNTREATED RAW WATER SUPPLIES OF CERTAIN CITIES LOCATED ON THE OHIO OR GREAT KANAWHA RIVER

Month	Ohio River								Kanawha River
	East Liverpool	Steubenville	Wheeling	Ashland	Ironton	Portsmouth	Cincinnati	Louisville	Charleston
1930									
January	15,254	1,505	970	10,800	5,500	4,710	1,348	2,742	1,139
February	8,614	2,170	1,900	13,850	7,600	5,130	1,096	1,900	575
March	2,422	143	1,500	15,500	9,000	4,680	1,320	565	1,232
April	2,703	129	440	10,900	2,600	4,300	454	172	1,296
May	146	586	120	21,600	4,100	8,196	216	257	3,435
June	778	216	390	17,500	7,600	9,100	88	139	9,370
July	10,423	1,362	6,600	15,800	4,000	4,970	111	166	8,748
August	10,091	23,350	8,800	7,400	12,400	2,538	13	240	8,258
September	2,035	20,000	9,700	10,600	7,480	3,766	25	208	144,400
October	24,656	2,110	7,100	28,900	15,000	3,967	13	137	84,435
November	10,882	10,540	9,400	42,800	2,700	6,766	6	154	2,726
December	32,064	15,000	10,000	2,985	2,800	4,100	12	21	2,945
1931									
January	13,036	262	3,700	23,600	6,200	4,600	165	32	1,374
February	34,750	1,810	4,700	19,300	3,000	2,507	733	180	2,117
March	22,745	1,220	2,600	6,230	4,160	2,654	910	251	2,216

Evidence as to the grossly polluted character of the waters of the Great Kanawha and the Ohio Rivers (Table I) need scarcely be given. The laboratory reports from each city show that the raw untreated waters were of their usual poor quality which from past experience are known to be capable of causing enteric diseases in the water drinking population, provided the safeguard of modern water purification is removed. No such break in the purification processes occurred at any time, as is shown by the *B. coli* indices of the treated effluent waters (Table II). The indices are without exception as favorable for the period of the outbreak as they have been for the corresponding months of other years. In addition this outbreak of acute gastroenteritis was not followed by an increase in the prevalence of typhoid fever, an occurrence which past experience has shown would surely follow the drinking of inadequately treated Ohio River water.

TABLE II

THE MONTHLY MEAN *B. coli* INDICES PER 100 C.C. IN THE TREATED EFFLUENT WATER FROM THE WATER PURIFICATION PLANTS OF CERTAIN CITIES LOCATED ON THE OHIO OR GREAT KANAWHA RIVER

Month	Ohio River								Kanawha River
	East Liverpool	Steubenville	Wheeling	Ashland	Ironton	Portsmouth	Cincinnati	Louisville	Charleston
1930									
January	0.06	0.00	0.00	0.00	0.06	0.00	0.06	0.00	0.00
February	0.00	0.19	0.00	0.00	0.25	0.00	0.11	0.00	0.00
March	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
April	0.00	0.00	0.40	0.00	0.04	0.07	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00	0.06	0.00	0.13	0.00	0.00
June	0.00	0.00	0.00	0.00	0.20	0.13	0.00	0.00	0.00
July	0.00	0.40	0.50	0.00	0.26	0.00	0.23	0.00	0.00
August	0.00	0.91	0.60	0.00	0.32	0.00	0.00	0.00	0.00
September	0.00	0.10	0.00	0.00	0.33	0.00	0.33	0.00	0.00
October	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
November	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
December	0.00	0.00	1.40	0.00	0.06	0.00	0.00	0.00	0.00
1931									
January	0.00	0.07	0.30	0.13	0.00	0.13	0.16	0.00	0.00
February	0.00	0.08	0.00	0.00	0.00	0.00	0.18	0.00	0.00
March	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00

One of two groups of organisms is commonly associated with epidemics of gastroenteritis having an infectious etiology—(1) Infection with an organism of the bacillary dysentery group. This is commonly spread through the water supply. (2) Infection with one of the group

of organisms commonly associated with outbreaks of so-called food poisoning. These organisms are rarely if ever spread through the public water.

The outbreak which we have under consideration does not give the usually severe clinical picture of an infection with a bacillus of the dysentery group. The mild clinical manifestations more closely fit the clinical syndrome associated with food poisoning, but we are here confronted with the fact that the epidemic most surely was water-borne and appeared successively in at least 6 widely separated cities with a common water supply; whereas other neighboring cities with similar environments, except for the water supply, escaped.

Let us accept as a fact for the time being that the epidemic was a water-borne infection with one of the organisms mentioned. Then it becomes necessary to assume that this organism could appear in the public drinking water in sufficiently large numbers to cause such an explosive and widespread outbreak without there being a corresponding increase in the *B. coli* index; or we are forced to assume that these organisms are capable of resisting the various processes of modern water purification to an even greater extent than does the *B. coli* organism. Such reasoning does not seem plausible.

The circumstances at Charleston point even more strongly to a form of chemical gastrointestinal irritant than is the case in the other cities. The city water supply is normally drawn from the Elk River at a point in the Elk River Pool, 1¼ miles above the confluence with the Great Kanawha River. Due to the widespread absence of rain in 1930, flow in the Elk River gradually diminished until by late October it had practically ceased. Consequently there was a reversal of flow in the river below the water works intake so that the nearly stagnant water from the lower end of the pool and from the Great Kanawha entered the intake at the filter plant. This water was heavily charged with domestic sewage, soluble wastes from the city garbage dump, a variety of industrial wastes, the dissolved products from a heavy sludge layer on the bottom of the lower pool representing the sludge accumulation of years, and with a heavy growth of algae. Actual septic conditions prevailed in the Elk from the intake down to the Kanawha. This new water was entirely depleted of dissolved oxygen and showed *B. coli* present in 0.0001 c.c.

In spite of heroic water purification methods, which did succeed in producing an effluent free from turbidity and *B. coli,* the water received by the public still possessed the same nauseating odor and taste as was present in the raw water. The odor was similar to that escaping from an active septic tank. The taste was exceedingly offensive.

Both odor and taste were removed by boiling for a few minutes.

The taste and odor became so disagreeable late in October and the first few days of November that the public practically refused to use the tap water for drinking purposes. The survey which the writer made on November 12 and 13 showed that in the families where sickness had occurred 80 per cent at the onset of illness were drinking the water as it came from the faucet, whereas in families where sickness had not occurred only 9 per cent stated they used such water, 41 per cent used boiled city water and the other 50 per cent obtained water from private sources. The fact that boiling the drinking water prevented the illness suggests that the cause might be a viable organism. However, the treated effluent consistently failed to show *B. coli* in five 10 c.c. portions, a fact which has always indicated a bacteriologically safe drinking water (Table III).

TABLE III

THE DAILY *B. coli* INDICES PER 100 C.C. IN CHARLESTON'S RAW AND TREATED PUBLIC WATER SUPPLY FOR OCTOBER AND NOVEMBER, 1930, DURING A PART OF WHICH TIME THE CITY WAS VISITED BY A WIDESPREAD OUTBREAK OF ACUTE GASTROENTERITIS

Day	Raw Water	Effluent Water	Day	Raw Water	Effluent Water
October			November		
1	10,000	0.0	1	100	0.0
2	10,000	0.0	2	1,000	0.0
3	1,000	0.0	3	100	0.0
4	1,000	0.0	4	1,000	0.0
5	10,000	0.0	5	100	0.0
6	10,000	0.0	6	100	0.0
7	100	0.0	7	1,000	0.0
8	10,000	0.0	8	100	0.0
9	1,000	0.0	9	1,000	0.0
10	10,000	0.0	10	1,000	0.0
11	100	0.0	11	1,000	0.0
12	100,000	0.0	12	0	0.0
13	10,000	0.0	13	1,000	0.0
14	100,000	0.0	14	1,000	0.0
15	100,000	0.0	15	0	0.0
16	10,000	0.0	16	10,000	0.0
17	100	0.0	17	10,000	0.0
18	100,000	0.0	18	10,000	0.0
19	1,000	0.0	19	1,000	0.0
20	1,000	0.0	20	0	0.0
21	1,000	0.0	21	100	0.0
22	0	0.0	22	10,000	0.0
23	100	0.0	23	0	0.0
24	100,000	0.0	24	10,000	0.0
25	1,000	0.0	25	100	0.0
26	10,000	0.0	26	10,000	0.0
27	10,000	0.0	27	1,000	0.0
28	10,000	0.0	28	100	0.0
29	1,000,000	0.0	29	1,000	0.0
30	1,000,000	0.0	30	10,000	0.0
31	100	0.0			

A series of events took place which may have some bearing on the outbreaks in the Ohio River cities. During the first week in November numerous dead fish appeared in the Great Kanawha opposite Charleston. Rain fell on the watershed of the Elk and Kanawha Rivers in December. Toward the end of December vast numbers of small fish died in the Kanawha, appearing particularly numerous 43 miles below Charleston. The dams on the Kanawha were lowered about January 1, the river having received enough run-off from the watershed to permit a good flush-out of the pools which had been accumulating wastes over a period of months. The men operating the dams complained particularly of the foul odors of decomposition coming from this released water with its accumulation of wastes. It is reported that numerous dead fish appeared in the Ohio River at Huntington and Ashland coincident with the appearance of illness in the inhabitants.

The prolonged absence of rain over the watershed of the Ohio and its tributaries caused a low water stage of unprecedented proportions. The dams were put in place on the Ohio early in May, 1930, and were still required at the time of the outbreak, thus establishing a series of pools into which only a small amount of diluent was added and in which there was only a sluggish flow. At the same time the volume of domestic and industrial wastes added to the river did not diminish. Because of the sluggish flow undoubtedly much of the undissolved wastes settled to the bottom, thereby building up sludge beds which under normal conditions would not have been possible. What new products of biological and chemical action were produced under such circumstances are unknown. Likewise the toxic action of sludge bed cleavage products has probably never before been tested on man on such a wide scale as took place at Charleston, and in a more dilute form in the Ohio River cities.

Tastes of a mild character do occur in the drinking water of all Ohio River cities from time to time, though never to such a degree as occurred in Charleston in early November. The presence of tastes and odors identical with those at Charleston, though less intense, appeared in the drinking water of each affected Ohio River city, being most intense during the period of the epidemic. This taste was not phenolic, but is better described as musty, decay-like, woody or mouldy. The odor from the hot water faucet was particularly musty. The taste at Louisville is described as distinctly strong and musty, which did not appear in the effluent water until the middle of January. This date coincides with the appearance of the illness in that city.

There is also a certain chronology in the appearance of the out-

break in each successive, down stream city. In Charleston it began about the last week in October and ended by November 10. Cases began in Huntington and Ashland on, or very near, January 1 and by the 10th a definite decline was taking place. Reports of cases in Cincinnati did not appear until about January 15 and it was not until after the 20th that the peak was reached. The peak at Louisville was apparently reached somewhat later than in Cincinnati.

Therefore, if we have correctly presented the epidemiological evidence in this series of outbreaks of gastroenteritis, the evidence is rather conclusive that the causative agent was transmitted by the public water supply which in the involved cities came from a common source. There is no epidemiological evidence to show that the ailment was produced by a viable organism contained in the water supply, unless we are to assume the sudden appearance of some bacterium or virus whose presence was not indicated by the established methods of water analysis. A series of stool cultures and serological examinations of many patients are also needed for a final answer.

The evidence strongly suggests that the acute gastrointestinal symptoms were brought about by the presence in the water of some chemical irritant whose physiological action simulated a strong purgative. The evidence does not show whether this chemical irritant was a cleavage product of bacterial action, a new chemical produced by bacterial synthesis, or the result of increased chemical concentration in the water brought about by a decrease in the diluent. There is at least a slight suggestion from the evidence that the toxic substance originated in the Great Kanawha River and was released into the Ohio when the dams were lowered on the Great Kanawha late in December, thereby releasing the pent-up wastes in a concentrated form which affected the public supply of each city as it moved down stream.

Raw or Pasteurized Milk

IN the extensive Lanarkshire milk experiment its authors concluded that "in so far as the conditions of this investigation are concerned, the effects of raw and pasteurized milk on growth in weight and height are, so far as we can judge, equal." The author of this article has rearranged the figures under the three groups 5, 6 and 7 yrs.; 8 and 9; 10 and 11, taking boys and girls separately, and produces tables which show a slight but distinct superiority on the basis of weight and height of raw over pasteurized milk. For all the children grouped together the advantage of raw milk for growth in weight is $0.86 + 0.42$ and for height $0.345 + 0.006$. The actual differences are admittedly small, but the experiment only lasted for 4 months.—W. G. Savage, *Bull. Hyg.*, Aug., 1931, p. 639.

What a Public Health Nurse Expects of Her Chief—the Health Officer*

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THE relationship between the health officer and the public health nurse is considered as that between an administrator and an executive. As a basis for discussion I have selected the functions for these two positions as outlined by Schell:[1]

> The administrator determines policy. His major function is to represent equally the rights of the owners, the employees, and the public, a responsibility which has come more and more into his hands with the constantly rising status of management as a profession, and the waning influence of the board of directors as an administrative force in business operation. He guides and controls the progress of the enterprise in its fight for existence and advancement. He decides what shall be done and, in large measure, his success lies in the quality of business judgment shown in these decisions. He coördinates and keeps in proper balance all of the factors of the enterprise which are necessary to success. Having provided the agencies and paths of action, he delegates the action to others. He holds the executive responsible for the work itself.
>
> An executive is one who is responsible for the execution of work performed by others. We look to him for accomplishment. We find him near the cutting edges of our industrial organizations where the main object is being approached. He is always close to the zone of action. Whether he be office manager in charge of clerks, district sales manager in charge of salesmen, or foreman in charge of workmen, his place is at the firing line. We may define the executive in still another way. He is the medium for the flow of orders and policies from the administrators to the employees.

The functions as outlined indicate definite fields, adequate preparation, and, I believe, mutual respect for each other's ability. The administrator has a slight advantage in that he has often selected the executive.

What then as public health nurses would we suggest to the health officer as standards for this selection? The National Organization for Public Health Nursing[2] presents minimum standards to succeed those

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* Read before the Health Officers Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 14, 1931.

offered at Boston in 1925 by the Nursing Section of the American Public Health Association and endorsed by the State and Provincial Health Officers, the Red Cross, and National Organization for Public Health Nursing. These standards in both instances were progressive for a period of 5 years and cover positions for staff nurse, supervisor and director.

I am sure we agree that education and experience are not enough, but they do make more effective the native ability of the individual. Pasteur said: "chance favors the mind prepared." Elimination of politics and improvement in the selection of personnel are the foundation of an efficient service. I cannot refrain from alluding to one of the replies to my request for advice on the content of this paper. It refers to the nurse applicant "who cannot forget her womanly charms long enough to get her work done. She is the person always recommended by a long list of gentlemen, often doctors, and sent to you with a letter from the man friend of Mr. Blank of the City Council—if no letter, he accompanies her personally and although 'only a friend' does all of her talking for her. You know her I'm sure." How well we all know her! A weakness for attractive women, however, is not limited to city fathers or health officers. A professor of home economics recently told me she had the greatest difficulty in placing her most capable but unattractive student because school superintendents preferred the pretty ones. I need hardly add that in a well organized service the executive nurse should have the privilege of recommending applicants, based on investigation and a personal interview.

What Does the Health Officer Expect of the Public Health Nurse?

To reduce the executive functions to practical public health organization—just what does a health officer expect of a public health nurse? First, I should say he expects her to execute the job, that is, to make possible expert nursing service in the one or more fields to which the service is committed. She is able to do this only when she has the authority to develop her program to conform to the best practices as outlined by such agencies as the National Organization for Public Health Nursing and American Public Health Association. Space permits only the mention of a few of the points they cover, such as procedures and technics, qualifications, supervision, staff education, salary, hours on duty, sick leave, and vacations.

The second thing a health officer should expect from the public health nurse is that he be kept informed on the service. Monthly reports of work performed are important, but they must be supplemented with thoughtful analysis and human interest. She, probably

more than any other person, has an opportunity to know the public's mind on the entire department program; yes, I might even say, to know what the medical profession thinks. She daily experiences the satisfaction of seeing the changing attitude toward confidence and respect for a modern health service, and too frequently hears the criticisms of the doctors because they do not know what it is all about. She should furnish opportune subject matter for education and publicity.

The third point might be included in the second, but for emphasis it has its place. Being close to the "firing line" she is able to observe community developments for new or coöperative services. In these days of reduced budgets there should be no duplication of work but a conscientious desire to carry on those services which officially belong to us. Dr. Ray Lyman Wilbur, Chairman of the White House Conference, in closing the second Conference, urged that all those present study the reports presented in relation to their own community needs and then make the application of the recommendations that fitted their situation.

Two instances of duplication in community service may be mentioned. In one, a preventorium maintained a field nurse to investigate applicants and follow up discharged cases. The official nurses were making regular visits in these same homes for infant, preschool, or school children, and in many instances had previously known the individual children. By transferring the field work to the official agency the preventorium was able to secure a much needed dietitian. In the other instance the city welfare department was sending an investigator into homes where a hospital order was requested by the prenatal clinic. This practice was discontinued when the nurse secured the data required for the records, which were practically those necessary to determine eligibility for clinic service.

Most men appreciate healthy, happy and contented women; so this is the fourth point a health officer expects. Probably no other time offers the same opportunity of selecting and maintaining a capable staff as the probationary period. This is the time to determine fitness for the job, for it is a difficult thing to eliminate the nurse unsuited to public health once she has received a permanent appointment. The consideration of the health of the staff is an important item—the nurse should exemplify the message she carries to the public. The things that make for a contented staff are a thorough introduction to the service with written policies or procedures for frequent reference, regular hours, a satisfactory salary, opportunity for promotion—in fact, those things which contribute toward a sense of fair

dealing and security in the job. I know a staff who although they failed to secure their automatic increases the past year willingly contributed a dollar a month per capita in addition to their annual pledge to the Community Chest during the winter months.

Every health officer sees his organization as a growing concern, which usually means increased personnel; this is especially true of the nursing service. He, therefore, looks to his directing nurse to recognize and develop those special abilities which make for leadership to meet a growing program. Staff education has come to be a recognized and legitimate expense of time and is compensated for in the interest and efficiency of the service rendered. Dr. Elliott Dunlap Smith of Yale has said: "Education is to create a thirst for knowledge, not to satisfy it—we must look on method as a growing thing which gives capacity to understand and reacts to enrich life." Public health nursing offers the most satisfactory laboratory experience. No two situations are alike, and the diversification of its application would indicate, through its growing demand, its success. These, then, represent what the writer believes a health officer expects of a public health nurse.

What Does a Public Health Nurse Expect of Her Chief, the Health Officer?

The first and most important factor is a definite, preferably written, purpose and policy of the organization service. Frequent changes are inevitable to meet the advancement in the growing field of public health. If the service is new and the budget is small, they should not be outlined to accomplish the millennium, so that the nurse is discouraged in attempting the impossible. Satisfaction in one's work is the best taskmaster. If too much is outlined the task is never completed.

Education of the community through publicity for a new project is an important step and saves endless explanations on the part of the nurse. This plan was most successfully carried out in Detroit in its Diphtheria Immunization Campaign last fall, before some 98 nurses were put in the field, and finally secured 73.3 per cent immunization of children between the ages of 6 months and 10 years.*

The second point in importance is frequent opportunity for advice and discussion of developments, especially problems. In large departments with a full-time health officer and bureau chiefs, new projects are usually discussed in the commissioner's staff conference, giving the nursing executive an opportunity to register her opinion as to the feasibility of projects in relation to her field. Too often though, with

a part-time health officer, the program is outlined to the last detail without consulting the public health nurse on whom responsibility may fall for its execution. This, and a failure of his recognition before the nurses of the important part they play, and his acknowledgment of it before the rest of his department, dampen the enthusiasm and lower the morale of even the most capable staff. On the other hand, there are commissioners who never miss an opportunity to commend the staff as a whole, or individual members, when outstanding service is brought to their attention. Constructive criticism is equally welcomed when mistakes occur.

It is also important in a large organization that opportunity be offered by bureau chiefs for frequent conferences on procedure if the service involves clinic or field service supplied by part-time physicians followed up by public health nurses. Frequently the most skilled technic developed by a nursing service is entirely nullified by a hurried and indifferent part-time physician. I have seen the most carefully worked out technic for the administration of diphtheria immunization become a dangerous and confused procedure because a physician, arriving an hour late, was determined to jam his morning's work into the remaining time, and the entire protective measures built up by a conscientious nurse on a communicable disease case destroyed by a doctor sitting on the bed taking the temperature of a scarlet fever patient without cleansing his thermometer before or after using.

The third point has to do with the growth and development of the nursing service. We believe that nurses know and understand nurses, and that the method of approach to certain situations is to a degree intuitive. If, therefore, in complete understanding based on belief and respect for ability, the health officer permits experimentation in the development of a service, personnel, or what-not, he stimulates a unique and progressive service. This experimentation may involve such minor points as changing nurses' districts, rotating supervisors, change of hours, but maintaining the work day, etc.; or it may involve the entire program of the nursing service, as generalizing 2, 3 or any combination of services.

Public health nursing has arrived at its present stage of development through experimentation on the part of the private nursing agencies, but because of the difference in organization and administration we need experimentation in official organizations, such as that made possible in the 3 demonstration areas in New York through the Milbank Fund, and other notable demonstrations. It has been my privilege to have had a part in one of these developments and to have seen the interest and appreciation of a large number of American and

foreign visitors who observed the work. *Public Health Nursing* carries the "good news that the Commonwealth Fund has granted the National Organization for Public Health Nursing $25,000 to finance a study of the present administration and practice of public health nursing. The study will cover both rural and urban services under official and unofficial administration in different sections of the country."

The fourth factor a public health nurse appreciates is an opportunity for advancement. Even resourceful people need recharging. The cheapest method is reading one's professional publications; the next, attending such meetings as this of the A. P. H. A., or other national health conventions, where one meets and hears leaders in the field. But to me the opportunity of the observation visit to an organization giving a good service in the field to be developed surpasses the chance discussion of a convention. The National Organization for Public Health Nursing is prepared to advise on where to observe outstanding work in the various fields of public health nursing.

Perhaps the most difficult method in official organizations for professional advancement, but the one which gives the greatest stimulation, is the leave of absence for study. Here you have all methods at your command, reading, hearing and meeting authorities in all fields, and contact with those of like purpose. I have had an interesting experience in observing the comparative value of the above opportunities, and believe there is a special value and even a proper sequence. A nurse who does not read her professional magazine has not much ambition or foundation to build on. However, with capacity to appreciate, the convention thrills and stimulates her to read more widely; the observation visit contributes new ideas, strengthens confidence in her own organization, and helps her to realize that all have problems; while study gives not only new knowledge and skill in her own field but opens up comparable fields and widens the chance of new and efficient application. These opportunities, however, are limited and should be given only to capable and ambitious nurses.

A continuous systematic and well planned staff educational program should be maintained to keep the entire staff in line with modern public health developments. In one community this program is planned by the directors of the visiting nurse, school, and health department services as a joint project for their three staffs. Much of the program the past year was presented by the county medical society.

It has been estimated by various health authorities that one-third to one-half of the annual budget of the health department should be expended in nursing service. If this estimate is correct, the nursing

service deserves the same recognition as other services by making it a separate bureau headed by its own chief and operating with its own budget. Opportunity for approval by the executive nurse of all publications, publicity and questionnaires relating to the nursing service would also be appreciated, and in return any requests from her should be approved by the administrator.

One of the best means of securing interest in and recognition for a nursing service is through a lay advisory committee, well versed in the program. Volunteer service also offers opportunity for community understanding. The child welfare committee of a local Federation of Women's Clubs recently asked a department of health for the privilege of assisting in the child welfare clinic service. The request was gladly granted and 8 women, each representing a separate club, were instructed in their duties for clinic service. It would be hard to estimate the far reaching influence that these volunteers contribute to this particular service.

The sixth and last point deals with a personal quality and one that is hard to develop if it has not been a growing attitude. I refer to tolerance, "a recognition of the right of private judgment." Schell speaks of judgment as the "area of discretion." If this area is vague and the public health nurse is at a loss to know how far she may rightfully go, with a tolerant chief she will assist in defining the boundaries through the experiences of the work, for she must know her authority and responsibility to administer the service effectively.

I quote two valuable suggestions for coöperative participation in any field of endeavor:[5] "Individually none of us is as good as he expects other people to be for whom he likes to set standards"; and "Acquire the habit of rating people not by the few things which attract or repel you, but by the general make-up, not just seeing people, but seeing into people."

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NOTE: In order more completely to represent the public health nurse profession in the discussion of what she expects of her chief, the health officer, the writer solicited suggestions from official directors in various parts of the country. Gratitude is also expressed to the 7 health officers it has been her privilege to serve, who unwittingly have contributed to a long and varied experience.

Wyatt Galt Johnston*

THE American Public Health Association at the first meeting held in Montreal for 37 years deems it a privilege, through the authority of its President, Surgeon General Hugh S. Cumming, of the U. S. Public Health Service, and its Governing Council, to do honor to one of its most distinguished members who passed away all too soon.

Wyatt Galt Johnston, M.D., Professor of Hygiene at McGill University in 1902, was the son of a doctor in Sherbrooke, in the Province of Quebec. He received his early education at Bishop's College, Lennoxville, and subsequently was graduated from the Faculty of Medicine of McGill University in 1884.

As an undergraduate, his interest in pathology brought him into close association with Osler. Following upon his graduation, he worked under Virchow in Berlin, returning to Montreal to be appointed a demonstrator in pathology at McGill.

Later, at the Montreal General Hospital, he devoted himself to the subjects of pathology and bacteriology, and soon became actively interested in medico legal work. His command of these subjects was speedily recognized both by his university and by the bureau of health in the province. Not only was he appointed a lecturer in bacteriology at McGill University, but the Provincial Bureau of Health of Quebec named him as Bacteriologist, and he was made Coroner's Physician for the District of Montreal.

Within ten years of his graduation, he was a leading authority on the subject of medical jurisprudence and a pioneer in the teaching of this branch of work.

Few men of his time in Canada contributed so much and such valuable research in the field of public health. Among his more important contributions may be mentioned "A new method for the culture of diphtheria bacilli on hard-boiled eggs"—a practical method of rapid diagnosis for the determination of diphtheria. It was in this connection too that in 1892 he introduced the use of sterilized swabs in test tubes for the taking of cultures. Writing that year, Dr. Johnston spoke as a prophet when he condemned "the practice of withholding antitoxin until the diagnosis of diphtheria is clear," adding that

* Remarks at the Grave of Dr. Johnston by the Chairman of a Committee appointed by the President of the American Public Health Association, during the Sixtieth Annual Meeting at Montreal, September 14, 1931.

"probably a large proportion of the deaths from diphtheria arose from delay in the use of this remedy. One would think it better that the remedy should be given 99 times to persons not having diphtheria than to omit it in 1 genuine case." Surely the prompt giving of diphtheria antitoxin was never more strongly urged, and this too at a time when its value and harmlessness were still matters of doubt.

The value of the bacteriological diagnosis of leprosy received Dr. Johnston's attention, and he urged its practice.

A biological analysis of Montreal's water supply led him to recommend regular and frequent examinations, for which he devised a method of collecting water samples at various depths—a distinct and practical contribution to public health work.

Dr. Johnston's memory has a particularly happy connection with the American Public Health Association, for it was at the Buffalo meeting in 1896 that he presented his paper, "On the Application of the Serum Diagnosis of Typhoid Fever to the Requirements of Public Health Laboratories." His work was synchronous with that of Widal, although in the matter of priority of publication, Widal was the more fortunate. It was to Dr. Johnston, however, in these early years, that we were indebted for a very practical method of applying the Widal reaction for typhoid fever. In his communication, he says: "Instead of taking the serum as soon as it exuded, I allowed the drop to dry on pieces of paper, and found that, upon moistening it, subsequently, the solution obtained was just as efficacious as the pure serum for the purpose of the test." Its use became widespread and enabled the easy transmission, by post, from afar, of blood specimens to his laboratories, to the great satisfaction of rural practitioners.

When in 1902 (the year of his death) he became Professor of Hygiene at McGill University, he had attained the summit of his career as bacteriologist, pathologist, and expert on public health, while at the same time he was the accepted authority in the field of medical jurisprudence. To quote from Professor Welsh, "He was the outstanding authority in America," while as an original thinker his researches were conspicuous by their brilliancy and their integrity.

Most of all, Johnston is remembered by his contemporaries for his lovable disposition, his brilliant humor and his manly qualities.

This simple record of the man's life reflects, in some degree, his qualities and his character, but the lasting quality of his work and the survival of his personality depended still more upon the vision and nobility of character of the man himself. It was his rare nature that gave his life's work its peculiar significance, and this was appreciated even more deeply by the members of his profession and his many

friends. Love of truth, sincerity of purpose, and human understanding were among the guiding principles of his very existence.

A wreath furnished by the Association was then laid upon the tomb by Dr. C. L. Martin, Dean of the Medical Department of McGill University, an associate of Dr. Johnston.

The brief ceremonies were attended by Mrs. Johnston, her son, and a number of Dr. Johnston's old associates and friends.

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Portugal Kindergarten in Children's Hospital

IN Lisbon, Portugal, one of the hospitals has had for some time a combination kindergarten-elementary school for children 3 to 10 years old confined to the hospital. Most of these children are suffering from protracted chronic diseases, such as tuberculosis of the bones or rickets; they are kept away from school for a long time, in some cases for years.

The school, which was established through the efforts of one of the physicians, is maintained by private contributions. The Government has accorded it the standing of a public school, and it is staffed by two teachers, who are normal school graduates.

In addition to suitable theoretical instruction, the children are taught manual work, singing, and drawing. The children participated in a recent international drawing contest. Motion pictures and other entertainments are also provided. It is reported that the children are much happier since the establishment of the school.—*Difesa Sociale,* Rome, May, 1931, p. 238.

EDITORIAL SECTION

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ENNION GIFFORD WILLIAMS
1874–1931

COMMISSIONER OF HEALTH OF VIRGINIA, 1908–1931

A LIFE of devotion to the cause of public health ended with the passing of Ennion Williams on June 6, 1931. As a boy of 18 he had confessed a wish to devote himself to the nascent science of preventive medicine. A study period in Germany under Connheim and Pettenkofer fixed his determination. He taught bacteriology and preventive medicine while establishing himself in Richmond in the new specialty of roentgenology.

As a successful practitioner he entered public life for the sole purpose of securing a betterment in the health service of his city. At 34 he gave up his practice to become Virginia's first Commissioner of Health. For 23 years he lived and dreamed and worked and fought for the health of his state. He became more powerful than governors and bosses, because all knew that he wanted nothing for himself but everything for his work. He was a kind man, but he could be hard when his work needed it. He was a gentle man, but he could fight like a tiger when his work was attacked. He was a generous man, careless of his own means, but he grudged every penny that was not productive of better health. He worked too hard, he died too young; but he worked for a purpose and he achieved that purpose, and all Virginia mourned his passing.

THE HEALTH OFFICER OF SAN FRANCISCO

THE appointment of Jacob C. Geiger, M.D., by the San Francisco Board of Health and Mayor Angelo J. Rossi, as Health Officer for the City and County of San Francisco, to succeed the late William C. Hassler, M.D., is an event of more than usual importance from the standpoint of public health. The Mayor has followed the lead of Governor Pollard, of Virginia, and Governor Roosevelt, of New York State, in selecting a health officer on merit, regardless of political considerations.

Following Dr. Hassler's death, the Mayor sent a memorandum to the Board of Health stating that political affiliations and party lines should be laid aside in the search for a suitable successor. He pointed out that Dr. Hassler had served 31 years in the Health Department, 15 of which were as City Health Officer, and that his efforts had resulted in the development of a department of unusually high standards. He felt that the board owed it to Dr. Hassler's memory to let nothing interfere with the selection of the most competent man available. He also showed his recognition of the importance of public health work in putting fitness above political considerations.

The Mayor also suggested the appointment of an advisory committee consisting of the Deans of the University of California and Stanford Medical Schools, the President of the County Medical Society, the Chairman of the San Francisco Health Council, and others, to consult with the Board of Health in the selection of the best fitted candidate. After a careful study of all sides of the question and the qualifications presented by some 10 candidates, the committee unanimously recommended Dr. Geiger. The *San Francisco Chronicle* quotes Mayor Rossi as follows:

> San Francisco is to be congratulated on the appointment of Dr. Geiger as Health Officer. I was deeply concerned in the selection of a man who would be a worthy successor of the late Dr. Hassler, who brought our Health Department to its present state of recognized efficiency.
>
> In the selection of Dr. Geiger neither politics nor influence played any part. Guarding the health of our population is too serious a problem to admit of any criterion in the selection of a health officer other than outstanding and recognized ability in this highly specialized department of medical science.

Dr. Geiger is a native of Louisiana. He was graduated with the degree of Doctor of Medicine from the Medical Department of Tulane University in 1912. He was for 8 years Director of the Laboratory of the California State Board of Health, and for 5 years Executive Officer and Deputy Health Commissioner of Chicago. In addition to his degree of Doctor of Medicine, he holds the honorary degree of Doctor of

Public Health, which was conferred on him for important research on mosquito control. More recently he has been Professor of Epidemiology of the University of California Medical School and the George William Hooper Foundation for Medical Research. During the World War he served with the U. S. Public Health Service at Camp Pike, Ark., on mosquito control work. Later he became epidemiologist for the commission which studied botulism under the direction of Professor Jordan of the University of Chicago. In this work he traveled over a large part of the United States investigating many outbreaks of food poisoning. Dr. Geiger is epidemiologist to the Southern Pacific Railway and the Dollar Line of steamships. In this latter capacity, during the summer of 1931, he made a trip to the Orient for the purpose of studying ventilation on immigrant ships. It will be remembered that many cases of meningitis have occurred among immigrants on ships from the Orient, especially the Filipinos. The study was made particularly in view of this fact.

Dr. Geiger has had a wide and varied experience in public health work, and we can congratulate the City of San Francisco in obtaining the services of so competent a scientist as well as an executive. Let us hope that the enlightened action of Mayor Rossi will soon be the rule and not the exception, assuring communities of merit, and worthy officers of security of tenure.

ASSOCIATION NEWS

LOUIS I. DUBLIN, PH. D.

PRESIDENT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

LOUIS I. DUBLIN was born in Kovno, Lithuania, November 1, 1882, and was brought to this country in 1886. He was educated in the public schools of New York, and graduated from the College of the City of New York in 1901. Between 1901 and 1904, he was a graduate student in biology at Columbia University, receiving his doctor's degree in 1904. In 1907, he undertook for the New York City Department of Health a survey of the tuberculosis situation, reviewing existing facilities for clinical and sanatorium care. After some months of service in life insurance medical statistics, Dr. Dublin was invited to collaborate with the late Lee K. Frankel and Miles M. Dawson in the preparation of *Workingmen's Insurance in Europe*, a survey for the Russell Sage Foundation of insurance systems, and their health promotion auxiliaries, in Europe, published in 1909. During 1909 and 1910, Dr. Dublin also served as lecturer on actuarial mathematics at New York University. In 1911, he became Statistician of the Metropolitan Life Insurance Company, and since has specialized largely in vital statistics and closely related subjects having a direct bearing upon the life and health conservation function of life insurance institutions.

From 1917 to 1923, Dr. Dublin was visiting lecturer on vital statistics in the Department of Public Health at Yale Medical School. In 1918 and 1919 he served under Dr. William Charles White as Statistician to the Commission for Tuberculosis of the American Red Cross in Italy.

Dr. Dublin is the author of *Mortality Statistics of Insured Wage Earners and their Families* (1919); editor of *Population Problems in the United States and Canada* (1926); *Health and Wealth* (1928). He was also co-author of *The Money Value of Man* (1930) with Alfred J. Lotka, and with the late Lee K. Frankel, of *Principles of Life Insurance* (1911). He has published in proceedings of various learned associations, in magazines and the daily press numerous papers and addresses on subjects

LOUIS I. DUBLIN, Ph.D.

in the public health and safety field, specifically on problems of racial and occupational mortality, infant and child mortality, cancer mortality, tuberculosis, the birth rate, population, sickness incidence and costs, etc.

During his 20 years of membership in the American Public Health Association, Dr. Dublin served for a time as Secretary of the Vital Statistics Section, and as Treasurer from 1925 to 1928 and again 1929–1931. He was President of the American Statistical Association, 1924; Chairman of the Statistics Section, National Safety Council, 1930; Secretary of the Section on Social and Economic Science, American Association for the Advancement of Science, and a Vice President of that Association. At present he is Chairman of the American National Committee of the International Union for the Scientific Investigation of Population Problems, a member of the National Malaria Committee, the Medical Council Research Committee, United States Veterans Administration, and of Committees and Boards of Directors of many health and welfare organizations. In September, 1931, he was elected Third Vice President and Statistician of the Metropolitan Life Insurance Company, and at the Montreal meeting of the American Public Health Association, 1931, he was chosen President.

JOHN A. FERRELL, M. D.

PRESIDENT-ELECT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

DR. John A. Ferrell was born at Clinton, N. C., December 14, 1880. He was graduated from the University of North Carolina with the degree of B.S. in 1902 and with the degree of M.D. in 1907. For 3 years, from 1902 to 1905, he taught in the public schools and was county superintendent of schools in his native County of Sampson, N. C. After graduation in medicine, he did general practice for 2 years in a small town and was county health officer of Pender County, N. C. Through these two early experiences, as teacher and county superintendent of schools, and as general practitioner and county health officer, he acquired an appreciation of the fundamental relation of education to public health and gained an understanding sympathy for the interest of the rank and file of the medical profession that has contributed in no small way to his subsequent professional career.

Early in 1910, with the organization of the Rockefeller Sanitary Commission, Dr. Ferrell was placed in charge of the Commission's work in North Carolina. For the next 3 years, 1910–1913, he directed an educational campaign against hookworm disease that resulted in the microscopic examination of 320,000 people, one-seventh of the population of the state, and in the treatment of 160,000 persons for the disease, that is, one-fourteenth of the population. So impressive was the conduct of the work in North Carolina for the eradication of hookworm disease that, with the transition of the Rockefeller Sanitary Commission into the International Health Board with its world-wide program, Dr. Ferrell was chosen as the Director for the United States.

Dr. Ferrell has contributed in a large way to the development of the basic policies that have characterized the work of the International Health Board, not only in its relation to the states of the Union, but in its relation to foreign countries. These basic policies, playing so important a part as they have in

the development of state and county health work in the United States, so completely reflect the mind of the Director of the International Health Board for the United States that they are mentioned here as reflecting the thought of the man whom the Association has honored with its high responsibilities. In general, the policies of the International Health Board are far-sighted, permanently constructive, and self-effacing, the agency itself never appearing in the foreground of the picture, indeed, rarely appearing at all. In particular, the International Health Board has followed consistently three guiding policies:

First, it has set up no new machinery through which to identify and perpetuate itself, but has always exerted its influence and made its contributions through the official, permanently constituted agencies of public health, the state and county health departments.

Second, the International Health Board has never undertaken work with the constituted authorities until after preliminary studies were sufficiently convincing to indicate that such work, once begun, would so appeal through its obvious merits to the constituency for whom it was done as to become, after a short period of time, self sustaining. The contributions of the International Health Board, therefore, have been predicated upon services so worth while that, if sustained through their initial development, would permit gradual withdrawal of the supporting agency and become established services.

Third, the International Health Board, with its world-wide viewpoint and experience, sharing the opinion of all authorities in the field of public health as to the most vital and essential need in the further progress of the movement, namely, adequately trained personnel, has during the last 15 years made large contributions for the establishment and maintenance of schools for the training of public health officials, Dr. Ferrell himself being one of their first graduates, having received his

JOHN A. FERRELL, M.D.

Dr.P.H. from the Johns Hopkins School of Public Health in 1919.

Dr. Ferrell's contacts with the health officers of the United States have perhaps been, during his service of 21 years with the International Health Board, more extensive and more intimate than that of any public health official identified with the broad phases of the public health movement, and in all of these contacts his whole attitude has been one of broad understanding, genuine helpfulness and self effacement.

In his extensive contacts, Dr. Ferrell has very naturally been prominently identified with other organizations, having served as Chairman of the Public Health Section of the American Medical Association 1922–1923, as a member of the Council of the American Public Health Association 1926–1929, as

Chairman of the National Malaria Committee 1924, and as Secretary of the North Carolina Medical Society 1911–1913. He is author of numerous papers and booklets on public health service.

HEALTH DEPARTMENT REPORTS

AT the meeting of the Editorial Board of the *American Journal of Public Health* in Montreal, Professor Ira V. Hiscock suggested that it would be better for him in future to send his reviews of "Health Department and other Reports" to Dr. Henry F. Vaughan to be incorporated in the section of Public Health Administration. It was decided to try this for the present; so readers may look for that material in the section noted.

All readers of the *Journal* are greatly indebted to Professor Hiscock for the very careful and excellent reviews which he has contributed for a number of years. The *Journal* takes this opportunity of expressing its appreciation of his services.

NEW MEMBERS

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PUBLIC HEALTH ADMINISTRATION

Health in Syracuse—The staff of the Health Department numbered 172 in 1930, of whom 130 were full-time employees. The department is organized under 13 bureaus. The appropriation by the city was $314,000 for health work or $1.49 per capita. In addition to this, the Milbank Memorial Fund provided a grant of $17,000 and paid for the services of 4 employees, while 7 others were paid by Syracuse University, and 3 by the Child Health Committee supported by the Community Chest. The death rate was 11.7 per 1,000 population, the lowest on record for this city.

Save for an outbreak of poliomyelitis with 150 cases, there were no abnormal conditions with regard to the communicable diseases. Diphtheria continued to decline, there being 23 cases compared to 31 in 1929, and only 2 deaths as compared with 4 for the preceding year. There were 4 cases of smallpox reported and there has not been a death for 42 years. The tuberculosis death rate has declined from 146 per 100,000 in 1908 to 47.7 in 1930, and 83 per cent of cases are now reported prior to death. There were known in the city 1,441 cases of tuberculosis. Of the fatal cases, nearly 40 per cent were reported more than a year prior to death.

Health education has received special emphasis in the Syracuse Health Department. During the year the newspapers were generous in the space given to health education, a total of 11,400 inches being given. The articles were illustrated with 101 pictures and there were 171 editorial comments. There were 51,600 copies of the monthly bulletin published, the mailing list being 4,000 per month. A regular weekly radio talk was broadcast. Application of the *Appraisal Form* gave a rating of 823 points. All divisions save venereal diseases, school hygiene, and preschool work rated 85 per cent or better.—George C. Ruhland, *Annual Report*, 1930.

Health in San Francisco—An appraisal has been made of the public health program for San Francisco for 1929–1930 by Professor Ira V. Hiscock. The government of the city and county combined is administered by a mayor and a board of 18 supervisors. The Board of Health consists of 7 members of whom 3 must be physicians. The term of office of each is 7 years. A full-time health officer is appointed under civil service regulations. The Board of Health, in addition to administering the health department, is responsible for the operation of the city hospitals, and the relief home. Plumbing inspection continues as a function of the health department.

In 1929 the personnel of the health department proper included 199 full-time and 28 part-time employees, of which number 72 were public health nurses and 49 inspectors.

The appropriation of the Board of Health for 1928–1929 was $2,426,000, of which $486,000, or $.76 per capita, were used for public health services proper. The application of the *Appraisal Form* showed a score of 826 points which is one of the highest attained by any city thus far scored. Sixty-three per cent of this score is due directly to the efforts of the Board of Health, while 4 per cent is contributed

by the Board of Education, and 33 per cent by the voluntary agencies including the medical schools, clinics, Visiting Nurse Association, Tuberculosis Association, and child health agencies. Venereal disease control, tuberculosis control, infant and preschool hygiene, and popular health inspection scored less than 80 per cent.

Of the 7,968 deaths in the city in 1929, 282, or 3.5 per cent, occurred among the Chinese population, which represents 1.5 per cent of the total population, and 8.5 per cent of the tuberculosis deaths were among the Chinese. There is need of better analysis and graphic presentation of vital statistics. There should be a comprehensive program for a vigorous immunization campaign against diphtheria and scarlet fever.

The reporting of venereal diseases averages about half of what might be expected. There is need for more medical and nursing follow-up service. San Francisco has one of the lowest infant death rates of any American city. The mortality death rate has decreased from 75 per 1,000 births in 1915 to 49 in 1929. The infant mortality among the Chinese in 1929 was 71 as compared with the rate of 98 in 1921.

Clinic services have been extensively developed and are conducted along modern lines. There is need, however, of an increased nursing personnel for home visits on behalf of infants. The school health service is a joint function of the Board of Health and the Board of Education. Annual examinations are being made in the kindergarten, first and fifth grades, and parents are urged to be present.

Vigorous efforts should be made to secure an increase in the personnel of the nursing division and it is recommended that a generalized public health nursing district be established for experimental purposes.

The milk supply is obtained from 200 producing farms and 97.9 per cent of the supply is pasteurized. The per capita consumption is 0.63 pints per day. Most of the producing dairies are located within a radius of 40 miles of the city. The work of the Sanitary Bureau is well organized and scores 99 per cent.—Ira V. Hiscock, *Appraisal of Public Health in San Francisco,* Committee on Administrative Practice, A. P. H. A., 1931.

Health in Memphis—Under the supervision of Dr. W. F. Walker, a survey has been made of health problems and facilities in Memphis and Shelby County, Tenn. In 1929, the staff of the department included 87 full-time and 14 part-time employees, in contrast to 49 full-time and 6 part-time employees in 1919. The total expenditures for public health activities in 1929 amounted to $152,776.83 or $.79 per capita, of which sum $.28 were spent for public health nursing. Of the taxpayers' dollar, $.02 were spent for health work.

Application of the *Appraisal Form* gave a weighted score of 619 points, the principal weakness being in the divisions of Infant, Preschool, and School Hygiene and popular health instruction, each of which rated less than 50 per cent of the standard.

The total death rate including resident and nonresident was 20.1 per 1,000 in 1929, being 15.7 for the white population and 29.0 for the colored. Excluding the nonresident deaths, the rate was 15.7 for the total population, 10.5 for the white population, and 26.2 for the colored. One factor which contributes to the high death rate is that Memphis is a hospital center for the surrounding area, 21.8 of all deaths having been among nonresidents. This is high when compared with the average American city. The death rate from tuberculosis

of all forms was 176.1 per 100,000, the rate being 70.1 for the white, and 387.2 for the colored. There is need for the execution of a plan to transfer to private physicians the responsibility for diphtheria immunization and medical examinations of preschool and school children.

A large number of births occurred in hospitals, 55 per cent of total births, 67 per cent for the white and 38 per cent for the colored. The maternity service attained the high score of 93 per cent; a total of 1,816, or 46 per cent, of all the births which occurred in 1929 were registered at the prenatal clinical of the Health Department. The work of the Sanitary Bureau is well organized, there being a special effort to secure installation of sewer connections in parts of the city which have previously been unsewered.

Malaria control work has been engaged in with extensive ditching and drainage to eliminate mosquito breeding places. There were 214 cases of malaria reported between June 15 and Oct. 1, and a special effort was made to popularize education in malaria prevention. The public health nursing division has made noteworthy progress although there is need for an increase in the nursing staff. The major change in organization recommended is the administration of all activities relating to tuberculosis control through a division of tuberculosis. It is also recommended that the departmental staff be increased to 119 full-time and 21 part-time employees, and that the yearly appropriation for 1930 be increased to $205,091. —*Survey of Health Problems and Facilities in Memphis and Shelby Counties, Tennessee, for 1929*, Shelby County Tuberculosis Society, Memphis.

LABORATORY

A STUDY OF THE EIJKMAN METHOD FOR DETECTION OF FECAL CONTAMINATION OF WATER*

GEREON M. S. WAGNER

University of Pennsylvania, Philadelphia, Pa.

EIJKMAN[1] attempted to simplify the method for detecting colon bacilli in water by taking advantage of the fact that fecal strains can be grown at 46° C. He incubated inoculated lactose broth fermentation tubes at this temperature and interpreted the results on the basis of gas formation. Brown and Skinner[2] found that only a small percentage of colon bacilli isolated from human feces produced gas in 24 hours at 46° C., and that 48 hours were necessary to include all gas-formers. They also found that many "typical" colon bacilli from polluted streams failed to grow in the Eijkman broth at 46° C. and that the test did not entirely eliminate *B. aerogenes*.

* This paper is abstracted from a thesis prepared in partial fulfillment of the requirements for the degree of Master of Science in the Graduate School of the University of Pennsylvania.

In order to test the value of the Eijkman method of detecting colon bacilli in water the following studies were carried out.

One hundred and sixty colon-like organisms from various sources were fished in duplicate from Endo plates—82 were from Endo plates inoculated with samples of human feces from 82 different persons, 3 were from plates inoculated with urine, and 75 came from as many different samples of water. All the cultures from the Endo plates were inoculated into lactose broth in duplicate. One culture was inoculated at 37° C. and the other at 46° C. for 48 hours.

Each strain was studied to determine its morphology, motility, and Gram staining reaction; its ability to liquefy gelatin, to produce indol, to form acetyl-methyl-carbinol, to grow in citrate solution; and to test its power to ferment sucrose and lactose broth. Three species were isolated—*B. coli communis, B. coli communior,* and *B. aerogenes.* These were divided in three groups. Group I included the organisms that gave acid and gas in lactose broth at 37° C. and at 46° C.; Group II included those that showed acid and gas at 37° C. but neither acid nor gas at 46° C.; Group III comprised the strains that gave acid and gas at 37° C. but only acid at 46° C.

Of the strains from human feces classified in Group I, 36 were *B. coli communis,* 22 *B. coli communior,* and 2 were *B. aerogenes.* In Group II, 2 were *B. coli communis,* 3 *B. coli communior,* and 2 were *B. aerogenes.* In Group III, 6 were *B. coli communis,* 8 *B. coli communior* and 1 *B. aerogenes.*

Of the strains from urine in Group I, 1 was *B. coli communis* and 1 *B. coli communior.* In Group II, 1 was *B. coli communior.*

Of the strains from water in Group I, 19 were *B. coli communis,* 17 B. *coli communior* and 10 were *B. aerogenes.* In Group II, 2 were *B. coli communis,* 6 *B. coli communior* and 2 were *B. aerogenes.* In Group III, 7 were *B. coli communis,* 5 *B. coli communior,* and 7 were *B. aerogenes.*

It is concluded that the Eijkman test is not trustworthy because of the great variation in the results obtained. Even though many cultures of the three species studied produced acid and gas in lactose broth at both 37° C. and 46° C., the percentage of gas was, on an average, lower at the higher temperature. Many otherwise typical strains of *B. coli communis, B. coli communior,* and *B. aerogenes* produced no gas but only acid at 46° C. or neither acid nor gas at this temperature although they fermented lactose at 37° C. with the formation of both acid and gas.

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SIMPLE TEST FOR AVAILABLE CHLORINE STRENGTH OF DAKIN'S AND OTHER SODIUM HYPOCHLORITE SOLUTIONS OF EQUIVALENT STRENGTH

A. H. ULLRICH

Director of the City Laboratory, Fort Smith, Ark.

WHILE both the arsenious acid-iodine-starch titrimetric method and the dilution-orthotolidin colorimetric method for the determination of available chlorine in hypochlorite solutions seem simple enough in the hands

of a chemist or skilled technician, these methods are apparently too difficult to find general application in the routine work as carried out in the great majority of hospitals. Realizing the need for a rather simple test whereby a comparatively unskilled helper can at intervals check the strength of Dakin's and other equivalent chlorine solutions, we have devised a modification of the above mentioned procedures.

PRINCIPLE

In the proposed method the percentage of available chlorine in Dakin's and other equivalent hypochlorite solutions is taken arbitrarily to lie between 0.45 and 0.55 per cent (For practical purposes these limits are close enough to the U. S. P. limits of 0.45 and 0.50 per cent for the modified Dakin's solution). With this as a basis, the quantity of standard tenth normal arsenious acid solution necessary to neutralize exactly a definite fixed quantity of chlorine solution is calculated for each of these limiting strengths. Thus by adding these calculated quantities of standard arsenious acid solution to two separate but fixed and equal quantities of Dakin's solution there is complete neutralization of the chlorine in one, and only partial neutralization in the other. The completely neutralized solution will show no color change on the addition of orthotolidin, while the partially neutralized solution will show a yellow or even orange color, depending on whether the particular solution in question approximates 0.55 or 0.45 per cent of available chlorine.

APPARATUS

Pipette graduated to deliver 5 c.c. Dakin's or equivalent chlorine solution. (Note: Our test is based on the use of a 5 c.c. sample of the solution to be tested.)

Pipette with two graduations, the first to deliver 6.43 c.c. N/10 As_2O_3, the other to deliver 7.86 c.c. N/10 As_2O_3.

Two 2-oz. ground glass stoppered bottles to be marked No. 1 and No. 2 respectively for convenience.

1 c.c. medicine dropper for orthotolidin.

Reagents

Standardized N/10 As_2O_3 solution.
Standard orthotolidin solution.

PROCEDURE

To each of the 2-oz. bottles add approximately 20 c.c. of distilled water and then exactly 5 c.c. of the solution to be tested.

To bottle No. 1 add standard arsenious acid solution as measured by the lower mark on the graduated pipette or 6.43 c.c.

To bottle No. 2 add standard arsenious acid solution as measured by the upper mark on the graduated pipette or 7.86 c.c.

Shake contents of both bottles.

Add 1 c.c. orthotolidin solution to each bottle.

RESULTS

No color in either bottle—solution tested weaker than the accepted Dakin's solution.

Yellow to orange color in bottle No. 1 but no color in bottle No. 2—solution tested has correct strength for accepted Dakin's solution.

Color in both bottles—solution tested is stronger than accepted Dakin's solution.

With the aid of this test previously prepared solutions can be adjusted to the Dakin's strength by either strengthening or diluting them as the case may be. Where both bottles show color the depth of color can be used as a guide in determining further dilution.

This procedure is not applicable for testing solutions containing oxidizing agents other than chlorine. It is intended only for solutions of chlorine or hypochlorites in which available chlorine is between 0.45 and 0.55 per cent.

VITAL STATISTICS

Census of Scotland, 1931—The population of Scotland on April 26, 1931, was 4,842,554, of whom 2,325,867 were males and 2,516,687 females. At the census of 1921 the total population was 4,882,497—2,347,642 males and 2,534,855 females. The 1931 population is thus 39,943 less than that reported at the 1921 census, the decrease of males being 21,775 and that of females 18,168. The intercensal decrease of the total population is equivalent to 0.8 per cent of the 1921 population, that of males being 0.9 per cent of the male population in 1921, and that of females 0.7 per cent of the female population in 1921. The number of females in the population exceeds that of males by 190,820. This excess of females over males is only 3,607 more than at the census of 1921, but is greater than at all previous censuses—the maximum difference previously being that of 1921, viz., 187,213. The ratio of females to males which was 108.0 to 100 in 1921 is now 108.2 to 100, though this ratio is not itself a maximum.

This is the first official census of Scotland which records a decrease of population. The first census was taken in 1801, when the population was reported to be 1,608,420, and each successive decennial census showed an increase, culminating in a total population of 4,882,497 at the census of 1921. The largest of these increases was one of 446,456 at the census of 1901. In 1911, the increase fell to 288,801 and in 1921 to 121,593. The natural increase of population in Scotland, i.e., the excess of births over deaths, during the intercensal period, amounted to 352,386, and as a decrease of 39,943 was found in the population, 392,329 may be taken as a measure of the population lost by migration. The natural increase in 1921–1931 was smaller than in any intercensal period since 1871.

The decrease of population in Scotland at the present census has been general in the counties. Only 6 out of the 33 counties (inclusive of burghs) show an intercensal increase, the 2 most noteworthy being increases of 2.2 per cent in the case of Lanark and 3.9 per cent in Midlothian. Decreases are recorded in 27 counties, amounting to 8.4 per cent in Orkney, 9.3 in Caithness, 9.6 in Sutherland, 11.3 in Ross and Cromarty, and 16.1 in Zetland. The counties of Argyll and Bute show the much greater decreases of 18.0 and 44.2 per cent, respectively, but both of these counties were materially affected by the taking of the 1921 census in the holiday month of June—the populations then returned being altogether abnormal and not admitting of comparison with the results of the present census. The same consideration to a less extent affected the holiday areas of other counties, e.g., Ayr and Fife. Even at the recent census the presence of visitors in appreciable numbers has been noted in the returns of certain holiday resorts.

Of the total population of Scotland 38.6 per cent are embraced in the four chief cities of Edinburgh, Glasgow, Dundee and Aberdeen, 15.7 per cent in the remainder of the 24 larger burghs as defined by the local government (Scotland) act, 1929, and 15.1 per cent in the small burghs, giving a burghal population of 3,361,384 or 69.4 per cent of the entire population, against 3,334,499 or 68.3 per cent at the census of 1921—an increase of 0.8 per cent. Of

the 24 large burghs 15 show an increase of population over that of 1921. The largest increases recorded are 36,890 in Glasgow, 18,734 in Edinburgh, 8,296 in Aberdeen and 7,268 in Dundee. The largest percentage increases are 7.8 in Inverness, 6.2 in Falkirk, 5.9 in Kilmarnock and 5.8 in Stirling. The largest decreases recorded are 4,945 in Dunfermline, 4,161 in Motherwell and Wishaw, 2,185 in Greenock, and 1,859 in Arbroath. The largest percentage decreases are 12.4 in Dunfermline, 9.5 in Arbroath, 6.9 in Port-Glasgow, and 6.0 in Motherwell and Wishaw and in Dumbarton. The abnormal decrease in Dunfermline is doubtless due to some extent to changed conditions at Rosyth. Some portion of the apparent increase shown in the large burghs may be ascribed to the absence of persons on holiday at the date of the 1921 census.

It is, however, the county areas outside the large burghs that have contributed most to the decrease in the total population. The population of the small burghs has declined from 769,245 in 1921 to 730,221 in 1931, a loss of 39,024 or 5.1 per cent, and that of the landward portions of the counties has fallen from 1,547,998 in 1921 to 1,481,170 in 1931—a decrease of 66,828 or 4.3 per cent. Thus while the population of the burghal area of Scotland has increased by 0.8 per cent, that of the landward area has decreased by 4.3 per cent. In the period 1911 to 1921 the rates of increase for the 2 areas were almost identical, being 2.6 per cent for the burghal area and 2.4 per cent for the landward.

In only 4 of the 33 Scottish counties are landward increases recorded in 1931, 6.5 per cent in Renfrew, 3.1 per cent in East Lothian, 1.1 per cent in Lanark, and 0.1 per cent in Midlothian. Elsewhere in the landward areas the decrease was general, the principal percentage decreases being 9.5 in Orkney, 9.7 in Sutherland, 9.8 in Kincardine, 11.5 in Caithness, 12.0 in Ross and Cromarty, and 17.1 in Zetland. Decreases of 14.5 per cent in the landward of Argyll and of 41.6 per cent in the landward of Bute are, as already explained, largely due to the presence of holiday populations in 1921. It will be observed that the increases and the smaller decreases are generally in those counties in which the landward areas are to some extent of an urban or semi-urban character, and that the larger decreases are in those counties, chiefly in the North and North-West, which are more rural in character.—*Prelim. Rep. Fourteenth Census of Scotland*, 1931, p. 6–7.

Abortion and Birth-Rate in Hungary—The number of abortions in Hungary has more than doubled in the last 20 years; at the same time the birth rate has fallen from 40.5 to 24.7 per 1,000. The number of abortions amounts to between 110,000 and 120,000 every year, and of these 70 per cent are criminal abortions. The cause of this state of affairs is attributed to the lax standards of doctors as to indications for induced abortions.

According to Hungarian law, pregnancy may be interrupted only if the life of the mother is earnestly menaced by pregnancy as such. The actual text of the law does not recognize even this indication, although legal practice has countenanced it. According to prominent Hungarian gynecologists, the law should be revised and reworded.

According to a recent lecture by Dr. Fekete, lecturer to the University of Budapest, it is generally held in Hungary that to allow artificial abortion without restriction would be equivalent to national suicide. In Soviet Russia artificial abortion was declared permissible in 1920, but only in institutions, and this has not proved an ideal method of dealing with the problems.

The public is not wholly aware of the

dangers of abortion; the mortality amounts to 1.2–3 per cent, and morbidity follows in 14 per cent of the cases, even if the operation is performed in well-equipped, modern operating theatres. In Hungary more than 1,200 women succumb to artificial abortion every year, and 6,000 to 8,000 women have ill-health following the operation.

The loss of population due to abortion ought at least to be compensated for by the increased care and protection given to mothers and infants but in Hungary the proportion of maternity beds to births is 990 to 200,000. In some places the ambulance has to carry a woman in labor a distance of 35 to 70 miles.—*Lancet*, 2: 314 (Aug. 8), 1931.

Vital Statistics for New Zealand, for the Year ended March 31, 1931—The mean population of the Dominion of New Zealand (exclusive of Maoris) for 1930 was estimated to be 1,425,084. This represents an increase over the corresponding figure for the previous year of 18,142, or a percentage increase of population of 1.29. The births of 26,797 living children were registered during 1930 as against 26,747 in 1929, bringing the birth rate for 1930 down to 18.80 as compared with 19.01 in 1929, 19.56 in 1928, 20.29 in 1927, and 21.05 in 1926. With 12,199 deaths and 26,797 births, the excess of births over deaths was 14,598 persons, or a natural increase of 1.0 per cent only of the total population. In 1870 the natural increase was 3.1 per cent.

There were 12,199 deaths in 1930 as compared with 12,314 in 1929, lowering the death rate from 8.75 in 1929 to 8.56 in 1930. Heart disease (all forms), apoplexy, or cerebral hemorrhage, and diseases of the arteries, combined, accounted for 3,988 or 32 per cent of the total deaths in New Zealand in 1930. In 1929, these diseases accounted for 29 per cent, and in 1928 for 28 per cent of the total deaths. Cancer has shown an increase during the last 5 years. In 1926 the death rate from this disease was 99.1 per 100,000 as compared with 101.9 in 1930. The 1,452 cancer deaths in 1930 comprised 11.90 per cent of the total deaths from all causes. New Zealand has the lowest death rate from tuberculosis in the world. In 1930, the lowest rate (45.5 per 100,000 population) in the last 5 years was reached, but even so, tuberculosis still took fifth place as a cause of death in New Zealand.

Among the common infectious diseases, pneumonic influenza, diphtheria, typhoid fever, and scarlet fever all showed decreases within the last year. The death rates per 100,000 population for 1929 and 1930 respectively were: pneumonic influenza, 8.5 and 4.6; diphtheria, 6.5 and 4.1; typhoid fever, 1.6 and 0.5; and scarlet fever, 1.9 and 1.1 Neither whooping cough nor measles is compulsorily notifiable in New Zealand.

There was a slight increase in the infant mortality in 1930, when the death rate of infants under 1 year of age was 34.48 per 1,000 live births as compared with the 1929 rate of 34.10. The reduction in infant mortality in the last five years, however, has been considerable—from 39.76 in 1926 to 34.48 in 1930.—*Report of the Director-General of Health*, New Zealand, for the Year ended Mar. 31, 1931, p. 5–9.

Vital Statistics for Illinois, 1930—Since reliable statistics have been kept, the State of Illinois has never experienced as low a birth rate as the one reached in 1930. There were 128,121 births recorded, giving a birth rate of 16.7 per 1,000 population. The excess of births over deaths was 44,529 and the difference between the birth and death rates was 5.8 per 1,000 people, indicating a net increase in the population from reproductive sources of 0.6 per cent. Experience in the past indicates that from 1,000 to 2,000 delayed birth re-

ports will be filed during 1931 and from 100 to 200 death certificates. These additions will make no significant difference in the rates, however.

The general death rate in 1930 was 10.9 per 1,000 population. Never before since the state was admitted to the death registration area in 1918 has the death rate been so low. The best previous record was in 1921 when the rate was 11.1. The total number of deaths from all causes in 1930 was 83,592.

The number of deaths from typhoid fever in Illinois went up from 110 in 1929 to 154 in 1930, causing an increase in death rate per 100,000 population from 1.4 in 1929 to 2.0 in 1930. Prior to 1900 most of the typhoid fever occurred in the cities. Now most of it occurs in the small towns and rural communities. In 1930, for example, the death rate from typhoid in Illinois cities of more than 10,000 population was 1.4 per 100,000 people while the rate in the remainder of the state was 3.0. The urban rate would have been still lower if no fatal cases from rural districts had obtained hospital care in the cities. Typhoid fever has become a problem chiefly of the southern third and the rural parts of the state.

The year 1930 marked a new low level for tuberculosis. Deaths from this disease numbered only 4,790 against 5,244 in 1929, giving death rates of 62.5 and 70.0 for 1930 and 1929 respectively. In no previous year since 1886 when the population was only half its present number had less than 5,000 deaths from tuberculosis been recorded in Illinois. There were 545 fatalities from diphtheria, giving a death rate of 7.1. Of these deaths, 411 occurred in Chicago, and 134 down-state, making the death rate for Chicago 12.1 and that for the remainder of the state 3.2. Excepting in 1927 when 102 deaths occurred, infantile paralysis mortality was heavier in 1930 than in any year since 1921. There were sixty deaths, giving a death rate of 1.2 from this cause in 1930. The scarlet fever death rate of 4.0 per 100,000 population is identical with the rate for 1929. Though the prevalence of this disease was high in both years the fatality was low, averaging less than 2 deaths per 100 cases. Pneumonia was responsible for 5,272 deaths in 1930; the death rate of 68.8 is lower than the lowest previous rate (78.8), which was recorded in 1921. Measles caused 90 deaths, giving a death rate of 1.2, which rate was second only to the rate of 1.1 which was attained in 1928.—*Illinois Health Quarterly*, 3: 152–159 (Apr.–June), 1931.

Analysis of the Census of 1926 for the Irish Free State, According to Ages, Orphanhood and Conjugal Conditions—According to a preliminary analysis (by ages, orphanhood and conjugal conditions) of the statistics contained in the 1926 census of the population of the Irish Free State, the proportion of persons unmarried in the Saorstat at each age is much higher than in any other country and marriages take place here at a comparatively late age. This applies both to males and females. At age 35–40, there are, in proportion to the population, three times as many unmarried males as in either Denmark or England and Wales. Of the females, 62 per cent are unmarried at the age of 25–30, whereas in the United States only 23 per cent are unmarried at that age. Moreover, this situation is steadily growing worse year by year. In 1841, 15 per cent of both males and females, at age 35–45, were single but in 1926 the number of single males at that age had increased to 45 per cent and single females to 29 per cent.

More males are unmarried at every age in the rural areas than in the towns. With respect to the females, however, this is true only of the early ages; above 35, a larger percentage of the females

are unmarried in the towns than in the rural areas.

The Saorstat has few married women of child bearing age. In proportion to the population there are only half as many married women under 45 years of age as are in the United States; only about 61 per cent of the number in England and Wales and about 66 per cent of that in Denmark.

Nevertheless, the married women of the Saorstat rear far more children than those in other civilized countries. In 1926, there were 131 children under 5 years per 100 married women under age 45, compared with 77 in the United States, 75 in Germany and 71 in England and Wales. Furthermore, this rate has not been declining as in other countries; in 1861 it was 130 as compared with 131 in 1926. In England and Wales, on the contrary, it decreased from 116 in 1861 to 71 in 1926.

Owing to the late marriages, the average age of Irish Free State mothers is much higher than in other countries. If the average age of married women in other countries were the same as in the Saorstat the difference in fertility would be even more marked. On this basis, the Irish mother raises more than twice as many children as the American mother and almost twice as many as a married woman in England and Wales. The general birth rate, however, is kept down as a result of the shortened child-bearing period caused by the late marriages.

Another result of the advanced age at marriage is the high death rate of parents of young children. Consequently, a larger proportion of orphans under 15 years of age are to be found in the Saorstat than is usual in other countries.

The lateness of marriage of males and the low death rate of elderly females result in a comparatively large number of widows, although marriages here are proportionately fewer than in other countries. In 1926, 41 per cent of the widows were over 70 years of age.

The Irish Free State has the largest number of persons over 65 years of age per 100 persons 15 to 65 of any other important civilized country. In 1926, the rate was 14.8 compared with 7.4 in the United States, 9.1 in England and Wales and 8.4 in Germany.

The expectation of life of males at birth in 1926 was 57.4 years but at age 70 it was 10 years; for females, at birth, it was 57.9 and at age 70, 10.7. As in other civilized countries the expectation of life has been increasing in recent years.—*Census of Population,* 1926. Saorstat Eireann, pp. 1–33.

PUBLIC HEALTH ENGINEERING

TRAINING FOR THE PUBLIC HEALTH ENGINEER*

DISCUSSION

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PROFESSOR Prescott has very clearly set apart the profession of public health engineering from that older branch of the engineering school with which it is even today so commonly confused, namely, sanitary engineering. This difference, as he has indicated and which the writer would re-state because of its importance, is largely one of emphasis. The sanitary engineer is primarily a designer or a builder. He is, in fact, a civil and hydraulic engineer specializing in a rather restricted field, confined for the most part to works relating to municipal water supply and sewerage.

The public health engineer on the other hand is primarily a student and worker in the field of public health. The range of his activities is wider, and his training and knowledge are of essentially different character. It is not so important that he know how to build a sewer as that he know why sewers are necessary and what results may be anticipated from the discharge of their contents without treatment into a body of water. Trained to think with the clearness and accuracy of an engineer, he employs as his material the data of physics, chemistry, and biology which underlie the present-day practice of public health.

Working with the physician or the physiologist he may make important contributions in such fields as school hygiene, or industrial hygiene, when the problems are largely physiological or pathological. The writer assumes that Professor Prescott's inclusion of industrial hygiene and health hazards in industry, within the scope of public health engineering, refers to the environmental aspects of these problems and not at all to their purely medical aspects.

Professor Prescott has indicated in some detail the content of a 4-year undergraduate course at the Massachusetts Institute of Technology leading to the degree of Bachelor of Science in Public Health Engineering. It may be of interest, therefore, to refer in comparison to the postgraduate course offered at the DeLamar Institute of Public Health, College of Physicians and Surgeons, Columbia University, in which we attempt to accomplish essentially the same object in a distinctly different manner.

This course is based upon the reasoning employed above in defining the public health engineer. It is a course of 1 full year, of 12 months, open to acceptable graduates in civil engineering and leading to a degree of Master of Science in Public Health Engineering. It presupposes adequate engineering training

* Discussion of paper by S. C. Prescott, read before the Public Health Engineering Section of the A. P. H. A., at the Sixtieth Annual Meeting at Montreal, Canada, September 17, 1931 (see October JOURNAL, page 1091).

and attempts to provide the supplementary public health background necessary to direct the young engineer's activities into channels which are essentially new to him and which lead him to consider the relationships between the environment and human health. Among the prerequisites therefore are adequate courses in physics, chemistry and either general biology or bacteriology. Since these last two subjects are generally weak and sometimes lacking in engineering education, the candidate may be required to complete certain work in the summer school previous to entering upon his year's study, and in any event the laboratory work has to be begun in a more elementary manner than is usual in graduate studies.

We have the distinct advantage, however, of having the candidate strictly within a small department for most of his time, which permits of intensive courses and close correlation between courses. We believe it also to be an advantage, rather than otherwise, that the student has completed his formal engineering studies so that the entire time and attention of a somewhat more mature student can be devoted to systematic training in public health.

The major work of this course is given under the titles "Public Health Engineering" and "Public Health Engineering Practice." In the first of these the subject is dealt with along the lines of the writer's textbook, *Principles of Public Health Engineering*, namely, the three major environmental contacts —air, water, and food—and certain other miscellaneous environmental factors. Under air we study both ventilation and atmospheric pollution by cities and by industries; and under water, both water supply and sewerage, which we purposely link together as complementary; and under food we treat two examples, the pasteurization of milk and the sanitary control of the collection and marketing of shellfish.

Among the matters of secondary importance considered are illumination, municipal cleansing and refuse disposal, and insect and rodent control. In each of these topics the stress is upon the fundamental chemical, physical, bacteriological, physiological or biological data upon which the engineering practice rests, and each topic therefore provides in its turn a basis for the construction of a considerable educational edifice of public health material.

Public Health Engineering Practice is an advanced course in which a special problem of some magnitude is developed by each student in a comprehensive manner.

The other foundation courses are vital statistics in which the material dealt with is directly related to public health, epidemiology with special stressing of the environmental factors, and sanitary engineering laboratory methods in which, as previously indicated, the student generally starts at the beginning and learns enough of chemical and bacteriological technic to complete a satisfactory examination of air, water, milk, or shellfish, and to understand and interpret the results of such examinations as well as those of the more strictly medical tests of blood, urine, throat cultures, etc.

These classroom courses are all of seminar nature, made possible by small groups of students, and are accompanied by extensive collateral reading and frequent reports by the student. Finally there is required during the summer a so-called field study in which the candidate is assigned to some definite organization, such as a state department of health, and is allowed to select a specific topic for survey or investigation under the actual conditions of practical administrative work. He is also required to take, either in connection with his field work or during the year, one optional study closely related to his selected field study and these together

provide the basis for his graduating thesis which completes the requirements for the degree.

The course outlined here parallels another course designed primarily for graduates in medicine or for students having had at least a full pre-medical college course and who likewise take the first general course in public health engineering. The objective here, however, is to provide a background for the proper interpretation of their future work in epidemiology and public health administration. The seminar method of teaching permits of considerable latitude in the assignment of problems and topics for discussion and each of the two groups of students admirably supplements the other's viewpoint, to their mutual advantage.

In this way we recognize what we believe to be an essential distinction in public health activities, namely, the medical and the engineering aspects. In either case we have found it distinctly advantageous that the doctor of medicine or the civil engineer, as the case may be, has come to the decision to enter the profession of public health as a specialty and comes to us well prepared and with a definite objective as to his future career.

The Use of Activated Carbon in Removing Objectionable Taste and Odors—The author suggests the use of the terms "carbon adsorption beds" and "carbon units" rather than "carbon filters." Experiments have been conducted in units of two sizes, one a bed 3.56′ in diameter and the other glass tubes about 1⅝″ in diameter. Such glass tubes have been found to give results comparable with those of the larger units.

The results of 17 months' operation of the larger unit with Hydrodarco are described. The flow was upward at the rate of 2 gal. per sq. ft. per minute and the bed was washed twice during the period in the manner used for rapid sand filters. In the glass tubes comparative tests were carried out using 5 types of carbon (Hydrodarco, Minchar, Woodchar, Bonechar and Nuchar), and the actions of a 48″ bed of fresh carbon and of carbon taken from the larger unit after 13 months' use and revivified by heating and by treatment with sodium hydroxide were tested.

The results are given in tables. It appears from these results:

1. That fairly deep beds are to be preferred, a bed 48″ in depth with water applied at a rate of 4 gal. per sq. ft. per minute reducing residual chlorine to a lower figure than a 24″ bed at 2 gal. per sq. ft. per minute.

2. That either upward or downward flow can be used. The maximum rate with upward flow is about 4 gal. per sq. ft. per minute with 4–12 mesh Hydrodarco. Higher rates can be used with downward flow but friction losses are greater and more frequent washings are necessary.

3. That the most suitable form of revivification depends on what the material has adsorbed. Where loss of activity was due to gelatinous compounds clogging the pores of the carbon, revivification for dechlorination was successfully achieved by drying at 105° C. or treating with a hot solution of sodium hydroxide.

4. That materials differing widely in carbon content are suitable for dechlorination.

5. That superchlorination followed by dechlorination by active carbon removes practically all taste producing compounds likely to be found in water.

6. That 1 lb. of Hydrodarco will reduce the residual chlorine in about 30,000 gal. of water from 1.0 to less than 0.1 p.p.m. without revivification, using a carbon bed 24″ deep at a rate of 2 gal. per sq. ft. per minute. By revivifying the material it is believed that 200,000 to 500,000 gal. of water may be dechlorinated per lb. of Hydrodarco.

—J. R. Baylis, *J. Am. Water Works Assn.*, 22: 1438, 1930. From *Summary of Current Literature*, Water Pollution Research, IV, 6 (June), 1931.

The Sewage Treatment Works of Zurich, Switzerland—An account is given of the sewage works of Zurich, Switzerland. The original plant, which was constructed to serve about one-third of the population so that experience could be gained for the design of the complete works, consists of rainwater overflow weir, grit chamber, 2" bar screen, sedimentation chambers, pumps for sludge, separate sludge digestion chambers, sludge drying beds and lagoons.

The effluent from the sedimentation chambers is discharged into the river Limmat and the ripened sludge is lagooned and sold as fertilizer. The main changes from the old plant in the construction of the new plant are enumerated. Cost data and diagrams of the sedimentation and digestion tanks are included.—M. Suter, *Sewage Works J.*, 2: 419, 1930. From *Summary of Current Literature*, Water Pollution Research, IV, 6 (June), 1931.

Use of Sewage Gas as City Gas—The chemical composition, the volume and dependability of supply, and the cost of sewage gas are considered with regard to its use as a city gas. Although sewage gas has a sufficiently high heating value to be useful, its slow rate of flame propagation is a disadvantage and its high specific gravity would necessitate a greater expenditure of power for pumping than in the case of the ordinary types of city gas; the flame characteristics would be greatly improved if the sewage gas were mixed with some other type of gas to increase the hydrogen content.

Sewage gas would afford a reasonably dependable source of supply but its maximum production could rarely exceed 1 per cent of that required for city gas and it would be produced in greatest quantities in the summer when it was least required. Its value to a gas company is equal to the enriching value and today enrichment can be obtained considerably more cheaply from bunker fuel oil.

The effect of temperature on digestion and the use of sewage gas for tank heating are discussed. A great saving in plant may be obtained by maintaining the temperature of digestion tanks close to the optimum temperature for digestion, i.e., in the vicinity of 77° F. It has been found that if the sewage gas is collected and used for heating the tanks, the temperature may be maintained above 70° F. throughout the year and thus the rapidity of digestion and capacity of the plant may be greatly increased.

It is concluded that the collection of sewage gas is justified if it is burned to prevent nuisance or utilized for heating the contents of digestion tanks, but it is not justified in the United States for use as a substitute for city gas.—W. H. Fulweiler, *Sewage Works J.*, 2: 424, 1930. From *Summary of Current Literature*, Water Pollution Research, IV, 6 (June), 1931.

Refuse Disposal and Steam Power—The Huddersfield destructor was built solely for the utilization of the refuse to generate steam. The following conditions had to be met in the design of such a plant: (1) A constant output of steam per hour; (2) maximum steam production per lb. of refuse burnt; (3) a great degree of mechanization of refuse handling.

The plant as constructed is probably the most efficient steam raising refuse incineration plant in existence at present. The plant will produce a steady supply of steam hour after hour and day after day. A harder clinker is produced than usual and the manual labor used in handling the refuse is reduced to a minimum. All refuse, even dust—excepting metals—is incinerated.

The incinerator will handle 28,000 tons of refuse per year; 500 tons of

metal and 5,000 tons of clinker, besides the steam, will be recovered for sale. Innocuous dust will be the only material dumped and will amount to about 15 per cent of the total refuse.

The plant will handle 180 tons of refuse in 18 hours (calorific value—5,000 B.T.U. per lb. as charged), by means of 8 Woodall-Duckham furnace type cells. Each boiler is served by the gases from two cells. The refuse is discharged into a storage hopper below ground level from the collecting wagons. The refuse is raised from the storage hopper by means of a grab and conveyed to a rotary distributor.

From the distributor the refuse goes through a magnetic separator where the metals are removed. The metals are sent to a baling press and the other refuse is sent to an auxiliary storage pit from where it is delivered by means of a grab to the feeding hoppers. The refuse is fed to the furnaces by means of hydraulically operated rams and is burnt by means of a pre-heated high pressure air supply delivered through tuyeres placed at the lower part of the furnace.

The non-combustible portion of the refuse is converted into a hard clinker. The gases of combustion are drawn through water-tube boilers and ejected into the chimney by means of dust extracting waste-gas fans. Each boiler is fitted with dust collecting chambers and arranged so that dust can be removed during operation. The steam is supplied to the electricity department.

Each furnace cell has a hydraulically operated clinker knife and door through which the clinker is discharged into a skip. The clinker is quenched in a suitable quenching tower and then crushed and graded after passing through a magnetic separator. The cost of the installation was £65,000.—Anon., *Surveyor*, 78, 2021: 383–386 (Oct. 17), 1930. From *Pub. Health Eng. Abstr.*, Jan. 31, 1931. Abstr. C. T. Carnahan.

Special Equipment and Careful Supervision in Los Angeles County Remove Objections to Garbage Disposal by Hog Feeding—A survey of 62 municipalities in this country indicates that the average cost of collecting garbage is $2.94 per ton. Other data show that where garbage is disposed of by hog feeding an average of $1.05 per ton is paid to the community by those collecting the garbage for disposal by hog feeding. Such disposal, therefore, reduces the net cost of collection to $1.89 per ton.

There are extensive hog farms in use in Los Angeles County to serve 44 municipalities and very successful results have been secured because of expert supervision, inoculation of hogs, the use of concrete feeding platforms, suitable shelters and adequate equipment for the disposal of unconsumed garbage and manure. These results have been secured largely through the control of hog ranches by the Los Angeles County Live Stock Department.

Thirty-nine licensed ranches were operated in 1929 and only three complaints were received relative to nuisances. Two of these complaints were due to one small plant where the owner neglected to dispose of the manure properly. The third complaint related to an odor temporarily present when a compost pile was removed.—L. F. Conti, *Am. City*, 43, 6: 86–89 (Dec.), 1930. From *Pub. Health Eng. Abstr.*, Jan. 31, 1931. Abstr. C. R. Cox.

INDUSTRIAL HYGIENE

Gases in **Manholes: A Survey of a Utility in Boston, Mass.**—The investigation was made in the city of Boston and 19 other contiguous towns in coöperation with the Edison Electric Illuminating Co. of Boston. The survey extended over a period of 1 year during which 1,765 different manholes were tested and 4,068 individual tests made.

The workers were put to the task of devising special apparatus for testing the gases in manholes (this is described). In regard to odor as a guide, it was found that the smell test is positive in indicating rather large amounts of combustible gas, but it does not give any indication of the relative amounts present.

As a general average, 6 per cent of the manholes tested contained combustibles or sewer gas at one time or another. The majority of these were in the city of Boston; manholes in outlying districts were usually free from gas. Two districts in Boston had manholes in which the combustibles were above the upper explosive limit and represented especially dangerous conditions.

Carbon monoxide and hydrogen were present in all samples which contained combustibles in amount equal to 25 per cent of the lower explosive limit, on which complete analyses were made. It is, therefore, concluded that leakage of manufactured gas was the chief source of combustibles in the manholes during the survey. In no case was gasoline or other similar hydrocarbon detected.

Sewer gas was found in 9 samples. The amount of combustibles was always so low in these as to present no explosion hazard, but on account of the low oxygen content such atmospheres would suffocate workmen who entered them without respiratory protection.

The results would indicate that it would be well worth while for utilities in other cities to conduct similar tests. —G. W. Jones and G. St. J. Perrott, *Report of Investigations,* U. S. Bureau of Mines, R. I. 3109: 1–16 (May), 1931. E. R. H.

Incidence of Miners' Nystagmus Among South Coast Coal Miners —While the examination of 500 South Coast miners was proceeding an opportunity was taken to determine the incidence of nystagmus among these men, to test out various methods described for its detection, and to find the value of the different methods with a view to forming standards of disability for compensation purposes.

It may be stated here that the incidence found was similar to that described by European investigators while certain of the more recent observations of Ohm on this subject were confirmed. —Charles Badham *et al.* (see previous abstract). E. R. H.

Sanitary Drinking Facilities with Special Reference to Drinking Fountains—The pamphlet contains recommendations for drinking water service stressing the importance of the type of drinking facility used, the standards of national agencies for the design of sanitary drinking fountains, and the various state laws, rules, and regulations pertaining to drinking facilities in places of employment.

One chart illustrates the state regula-

tion in regard to the prohibition of the common drinking cup in places of employment and a second chart, similar laws, regulations, and recommendations concerning the problem up to April, 1930. A selected bibliography accompanies.—Marie Correll, *Bulletin No. 87*, Women's Bureau, U. S. Department of Labor, 1931, 26 pp.

Division of Occupational Diseases, Connecticut State Department of Health—The Division has been granted a budget of $32,152 for the biennium 1931–1933, and an additional chemist has been added to the staff, which now consists of a director, medical doctor; engineer to make surveys and technical determinations of workroom environment in the field; physical chemist for laboratory determinations; secretary; and well equipped laboratory. Additions may also be made as occasion requires. E. R. H.

The Carcinogenic Potency of Mineral Oils—In the process of manufacture of refined shale oil, the most potent fraction tested was found to be the unfinished lubricating oil. The refined oil was somewhat less potent, while the cruder products were on an average about 60 per cent less potent.

Samples of refined petroleum lubricating oils obtained from various fields of the world had widely different degrees of activity. A sample of Venezuelan oil was very potent, while Russian and Pennsylvanian samples were on an average less than one-tenth as active. Many other oils had an intermediate activity. However, two oils from the same area may have widely different activity, probably having come from different fields or having been more thoroughly refined with acid. For example, two Texas oils gave us potencies of 1 and 30, respectively.

As a rule the heavier grade oils tested were found to be less potent than spindle oils. The amount of acid used in refining may account for the difference.

The addition of lanolin or sperm oil materially lessened the carcinogenic activity of the oils; in two cases 10 per cent lanolin reduced the potency 89 per cent.

Several saponifiable oils tested showed no carcinogenic activity; with regard to mineral oils, it appears that in general terms, the more saturated the constituent hydrocarbons the less capable were they of inducing cancer in experimental animals, the physical characteristics being similar.

The fluorescence of oils may be related to their potency. We have examined chrysene and found that, although very little soluble in the diluents used, it had a definite carcinogenic activity.—C. C. Twort and J. M. Twort, *J. Indust. Hyg.*, XIII, 6: 204–226 (June), 1931. E. R. H.

Cottonseed Oil (Milling and Refining)—The present scope and economic status of the cottonseed oil industry is given in statistics with a discussion of the types of workers and working conditions and a description or classification of jobs with their potential health hazards.

Among these are to be noted especially dust (silica being an important one), skin irritants with their corresponding skin diseases, and gossypol, a toxic body contained in cottonseeds which may be harmful through skin contact. (Illustrations accompany.)—Retail Credit Company, *Industry Report*, 6, 8: 85–94 (Aug.), 1931.

Trichlorethylene, Its Properties and Uses—In 1925, the company below named began the manufacture in this country of trichlorethylene, a solvent which has been produced in Europe for over 20 years. Of late years greater interest has appeared in this direction.

The physical and chemical properties,

specifications, principal uses and applications of the substance are given in detail. Supplementing these data, considerable space has been devoted to the present-day methods of use, such as fat and oil extraction (as from caffeine and nicotine), edible and inedible oils, bones and leather, the purification of explosives, and in analytical work.

The substance is also used in degreasing, degreasing processes, dry cleaning of textiles, wax removal from mineral oils, as a refrigerant, insecticide and fumigant, etc. It may also be mixed with certain other solvents, especially benzol and naphtha, certain precautions having to be taken.

As to physiological properties, from available evidence, trichlorethylene is not cumulative in its effect on the human system and produces no permanent impairment of health as a result of ordinary exposures to its vapors. Excessive exposure may produce intoxicating effects. These, however, disappear quickly on access to fresh air, since "Tri" is rapidly eliminated from the body. So far as relative toxicity is concerned, it is less dangerous than chloroform and many other chlorinated hydrocarbons and a number of petroleum solvents.

During the 6 years in which "Tri" has been manufactured by the present company, there is no record of any workman being so affected by its vapors that he found it necessary to obtain first aid or medical assistance.

Regardless of the comparative physiological action of different solvents, the equipment in which these solvents are to be used should be scientifically designed and built so that the health of operators is not endangered. Since small leakage or loss may occur even in the best designed plants, it is well to know the relative toxicity of different solvents, as indicated in various toxicity tables. These tables are based on reliable data but they all suffer from one drawback—there is no consideration of the human element. If any one of them is handled in a negligent manner, the health hazard is increased tremendously. The relative toxicity of various solvents including "Tri" is given in an Appendix to the present work.—The Roessler & Hasslacher Chemical Company, Empire State Building, New York, N. Y., 1931, 38 pp. E. R. H.

Benzol (Benzene) Poisoning—This is a new investigation of the toxicity of benzene and benzene impurities. A concise statement is made covering the history, chemistry, and industrial uses of benzene, acute benzene poisoning, chronic benzene poisoning, benzene dermatitis, and the medico legal aspects of such poisoning.

New experimental work with benzene is discussed in considerable detail, including a highly purified product, the toxicity of impurities and of homologues of benzene. Protocols of animal experiments, charts and comments constitute the chief body of the monograph.

Experimental work has clearly demonstrated toxic manifestations from all benzenes used, the lesions simulating those known to characterize benzene poisoning in man. Highly purified benzol is no less toxic than any other variety studied, and has produced a higher death ratio than any other benzene. No differences in manifestations among animals have suggested different types of lesions resulting from different grades of benzene. Such lesions as have been obtained have been relatively uniform. Benzene is in itself a toxic entity. All evidences of toxicity from benzene solutions containing rubber or similar sulphur bearing substances are to the effect that the benzene content is solely responsible.

Contrary to the usual beliefs, leucopenia does not invariably accompany benzene poisoning, and even severe poisoning may exist in the presence of

normal or above normal numbers (below 5,000). Single counts are of restricted value. A sustained leucopenia in suspected benzene poisoning is of diagnostic value, but in itself is not pathognomonic.

In the examination of tissues, two lesions stand out as of special significance: (a) nephritis with a special point of attack in the convoluted tubules, though not necessarily limited to them, but so unlike the usual nephritis as to constitute diagnostic evidence; and (b) hypertrophy of the stomach, most observable in the pyloric region. Acute ulcers have been observed, principally on the greater curvature near the cardiac end in the stomach (rabbits). Infections play an important part in determining fatality in benzene poisoning in rabbits, and, while several animals died from benzene poisoning itself, it is thought that infection is more than a terminal process in this form of poisoning.

Studies were likewise made of the toxicity of impurities of benzene, viz., acetonitrile, thiophene, amylene, methyl disulphide, and carbon bisulphide. Rabbits were again employed as the test animals. All chemicals were administered through inhalation. With respect to these, the results do not provide any evidence tending to place the burden of benzene toxicity upon its impurities.

The relative toxicity of 14 homologues of benzene, the principal ones being toluene and xylene, is commented upon and experimental evidences adduced to support the current belief that wherever practical toluene and xylene should be substituted for benzene because of lessened general toxicity.

Several pages are devoted to methods for the determination of benzene in the form of vapors admixed with air, likewise a section on the treatment of benzene poisoning and another upon practical protection. An exhaustive bibliography accompanies.—Carey P. McCord and collaborators, mimeographed monograph, Industrial Health Conservancy Laboratories, Cincinnati, 1931, 78 pp. E. R. H.

Butchers' Dermatitis—From the author's summary:

Butchers' dermatitis, characterized principally by erythematous areas on the hands followed by the appearance and subsequent eruption of pinhead vesicles, and accompanied by considerable itching as a symptom, is an occupational disease largely affecting butchers and inspectors who handle freshly killed carcasses.

The lesions, which first appear on the webs of the fingers and spread to the sides and backs of the fingers and to the backs of the hands as far as the wrists, may extend up the arms as far as the elbows, and in exceptional cases may spread to other parts of the body such as the chest, abdomen, legs, and face.

The affection does not appear immediately upon the exposure of susceptible persons, but usually makes its appearance after an initial period of exposure varying from 3 to 30 days, during which time susceptible persons presumably become sensitized to the tissues and fluids of swine, cattle, and sheep.

While certain persons make a rapid recovery following the first attack, with or without treatment, others develop repeated attacks while the exposure to the inciting cause is continued; in some persons the susceptibility lasts for several years. The available evidence indicates that many seasoned workers lose their susceptibility to this affection in the course of time.

While most susceptible persons appear to become fairly equally sensitized to the various classes of meat food animals that are slaughtered in abattoirs, certain persons exhibit a specific susceptibility to one or two classes of these

animals and are unaffected by contact with others.

The dermatitis may be checked by various local applications commonly used in treating related skin troubles in which there are no constitutional symptoms.

On the basis of available evidence, frequent washing of the hands in cold running water, thorough scrubbing of the hands with soap and brush at the end of the day's work, and coating the hands with vaseline or other ointments before beginning the day's work are, in most cases, effective prophylactic procedures.—Benjamin Schwartz, *J. Indust. Hyg.*, 13, 7: 233–243 (Sept.), 1931. E. R. H.

Observations on the Working Capacity of Coal Miners in Relation to Atmospheric Conditions—From the authors' summary: The influence of atmospheric conditions on working capacity was measured by noting the duration of rest pauses taken from work. Observations were made on 304 men for an average period of 97 minutes each, or for a total of nearly 500 working hours.

The amount of time taken for rests was more closely associated with the dry bulb factor than with the wet. The association between rest pauses and atmospheric conditions is not a very close one, and does not enable one to forecast what amount of rest any particular miner, or small body of miners, would take under given atmospheric conditions. There are evidently other factors which have a more powerful influence on production than atmospheric conditions, which might nullify the good effects of any improvement in these conditions.

Neither the relative nor the absolute humidity of the air seems to have any definite effect on the amount of time taken for rests when the dry kata cooling power is kept constant.

The observations suggested that in a hot, dry mine, working conditions might be improved by the use of artificial humidification. An experiment in this method of air conditioning was carried out, but owing to certain unforeseen and unavoidable circumstances, the results were, practically speaking, completely negative.

It is concluded that if the relative influences of the dry and wet bulb factors on working capacity are to be accurately assessed, the matter must be investigated under laboratory conditions.—T. Bedford and C. G. Warner, *J. Indust. Hyg.*, 13, 7: 252–260 (Sept.), 1931. E. R. H.

A Study of Dysmenorrhea at the Home Office of the Metropolitan Life Insurance Company—Author's summary:

1. Severe cases of dysmenorrhea (congestive and infantile type) can be improved, and about 50 per cent can be cured.

2. The best results are obtained by using daily both the Mosher and setting-up exercises.

3. Constipation plays a large part in causing dysmenorrhea and necessitates careful regulation of diet.

4. Psychologic factors, such as self-discipline, also play a part in treatment for dysmenorrhea.

5. There has been a considerable saving in time lost, both from absences from work because of dysmenorrhea and from visits to the rest rooms at the Home Office of the Metropolitan Life Insurance Company, through the treatment of severe dysmenorrhea and through watchful supervision of the milder cases.—Ruth E. Ewing, *J. Indust. Hyg.*, 13, 7: 244–251 (Sept.), 1931. E. R. H.

FOOD, DRUGS AND NUTRITION

Relation of Manganese to the Nutrition of the Mouse—While observations indicate a wide distribution of manganese in the vegetable and animal kingdom and it is definitely shown by recent work that manganese plays no rôle in hemoglobin formation, it is concluded that it does have a definite physiological action, perhaps in connection with reproduction.

The authors have found it possible to make preparations of casein, sugars, salt, vitamins A and D, practically manganese-free but in view of the difficulty of securing manganese-free vitamin B complex, resort was had to milk which contains approximately 0.02 mg. Mn per liter.

Mice were the experimental animals in order to conserve the supply of manganese-deficient foods.

Stock females were transferred to individual, raised, screen cages before the young mice were born and every precaution taken against contamination of any food material with manganese during the weaning period. After weaning, the young mice were divided into two groups, one receiving milk supplemented with 0.15 mg. iron and 0.01 mg. copper daily, and the other the same diet with addition of magnesium chloride to supply each mouse with 0.01 mg. of Mn daily.

In some instances, the milk ration was supplemented by a practically manganese-free mixture of lactose, butter oil and casein. With these diets, the growth curves indicate that the manganese had a definite effect on growth. As a typical result, in the case of 2 females from the same litter after 7 weeks on the experimental ration, 1 mouse weighed 19.1 gm. and the other on the manganese-free diet weighed 12.7 gm.

A study of the ovulatory rhythm shows that manganese is closely connected with the reproductive organs. In the case of the mice receiving no manganese, in only 1 mouse out of 5 did the estrus cycle make its appearance—then only twice. With manganese during the same period of observation, the number of estrus cycles increased from 3 to 8 and 1 mouse gave birth to 5 young when 134 days old. The frequency of the cycles in the manganese group appears to be approximately normal. While it is concluded that manganese has a distinct influence on the ovarian activity, no opinion is expressed as to the mechanism of this action.—A. R. Kemmerer, C. A. Elvehjem, and E. B. Hart, *J. Biol Chem.*, 92: 623 (Aug.), 1931.

Effects of Deprivation of Manganese in the Rat—As a preliminary to the study of the deficiency of manganese in the diet, it was necessary first to provide an adequate diet of manganese-free food materials. By the spectrographic method of examination of a wide variety of foodstuffs, the following food dietary factors were found practically manganese-free: starch, sucrose, casein, butter fat, vitamins A, D, and E, sodium chloride, calcium lactate, and K_2HPO_4, NaH_2PO_4 and $CaH_4(PO_4)_2$.

Essential dietary factors such as supplementary proteins, vitamins B and G, an iron salt, and a magnesium salt not available in a manganese-free condition were prepared by methods devised by the authors so as to be practically manganese-free. The vitamins and supplementary proteins were prepared by ex-

tracting yeast in 50 per cent alcohol and the iron and magnesium salt were the hydroxides.

Four different diets were given the young rats: first, the diet manganese-free; second, the control containing the substances with the natural content of manganese; third, manganese-free ration plus 0.005 per cent manganese as $MnCl_2 \cdot 4H_2O$, approximating the average amount in animal and vegetable tissues; and, fourth, manganese-free diet plus 0.05 per cent manganese. All diets contained 15 drops per kilo of Viosterol. All precautions were taken to prevent contamination of animals or cages with manganese.

On all four diets, young rats grew to maturity and those on the manganese-free diet did not differ materially from well nourished rats on a diet continued 7 months or more. The organs of the rats on the manganese-free diet as well as the new-born rats and rats 15 days old of mothers on the manganese-free diet showed no manganese. Manganese is present both in the organs and in the bodies of young rats on normal diets, indicating transmission of manganese through the placenta.

Absence of manganese did not interfere with hemoglobin formation, nor was the addition of manganese able to effect hemoglobin regeneration in the case of experimental anemia. Females on the manganese-free diet appear to have normal estrual cycles and normal litters when mated with normal males. The females, however, failed to suckle the young in 58 out of 59 cases. The same females when given foster young from known litters failed in 8 out of 10 cases to suckle them.

Females from stock colonies showed little interest in the young of manganese-free mothers, although 7 out of 107 manganese-free young were so reared. These were undersized in spite of having secured the necessary food. Male rats show no abnormality until about the 100th day when testicular degeneration appears with progressive atrophy until complete sterility results. Sexual potency in the male was restored by the addition of manganese to the diet.

The authors conclude as a result of similar clinical evidence in human subjects that manganese is essential to the production in the hypophysis of a hormone which regulates the function of the testes in the male and the mammary tissue in the female.—Elsa R. Orent and E. V. McCollum, *J. Biol. Chem.*, 92: 651 (Aug.), 1931.

Beneficial Effects of Fat in High Sucrose Diets when the Requirements for Antineuritic Vitamin B and the Fat-Soluble Vitamin Are Fully Satisfied—These authors reported previously (*J. Biol. Chem.*, 83: 269, 1929) that the presence of dietary fat reduces requirements for the antineuritic vitamin. This work was undertaken to determine whether diets improved by vitamin B can be further improved by additional fat.

Female rats, 21 days old, reared in individual cages on raised wire screens, were the experimental animals. The fat-free diet consisted of specially treated casein, autoclaved yeast, sugar, and salt mixture. The fat diets were on the basis of 25 per cent fat with adjustment of sugar and casein levels to maintain approximately the same nutritive ratio. The fats were lard, coconut oil, synthetic cottonseed and synthetic coconut oil. The synthetic fats were prepared by saponification of the natural fats and esterification of the fatty acid with redistilled glycerol.

Brewer's yeast, ether-extracted wheat germ and rice germ, and alcoholic extracts of rice bran and rice polish were used as sources of vitamin B.

Three experimental series are recorded. In each of these vitamin B was fed at many times the level for the requirements of the rat. In the first

experiment, growth of animals on the fat-free diet was inferior to the diet containing 25 per cent of lard, although both were supplemented with vitamin B from the wheat and rice germ and with the extracts of rice bran and rice polish.

This series disclosed the fact that rats on the normal stock diet were definitely inferior to those receiving the fat supplement and not superior to the fat-free diet.

In the second series, the 25 per cent fat component was synthetic cottonseed oil. This series shows beneficial effects of the diet in those cases where the vitamin B supplement was brewer's yeast or rice polish extract.

In the third series, with rice bran and rice polish extract as vitamin B additions, the rats receiving the natural coconut oil and lard adjustment were superior to those on the fat-free diet. The series in which the animals received a high supplement of rice bran extract was allowed to run a year, and while the animals on the fat-free diet showed no marked deficiency at the end of this time, they were definitely inferior to those receiving fat as is evidenced by coarser fur, tendency toward skin dryness, and lower body weight.

The authors conclude that the improvement is not due to fat-soluble vitamins as the same improvement was shown by synthetic fats and that vitamins A, D, E and F were abundant in all diets.—Herbert M. Evans and Samuel Lepkovsky, *J. Biol. Chem.*, 92: 615 (Aug.), 1931.

Distribution of Manganese in Foods—It was the aim of this investigation to supplement data already reported. The procedure given by Davidson and Gapen (A. O. A. C., XII: 310, 1929) was followed in the analyses of samples containing 0.1 mg. or more of manganese, while foodstuffs containing very small amounts of manganese were analyzed according to the modification reported by the authors in the *Journal of Biological Chemistry* (88: 347, 1930).

The manganese content of 83 representative food materials is given. The concentrations range from 0.028 mg. per liter of milk to 49.9 mg. per kilo of bran flakes. Thirty-six of the materials contained less than 1 mg., 25 contained from 1 to 5 mg., and only 22 more than 5 mg. per kilo of fresh material.

Arranged in descending order with respect to their manganese content, 12 classes of foods representing 138 food materials appear as follows: nuts; cereals and their products; dried legume seeds; green leafy vegetables; dried fruits; roots, tubers and stalks; fresh fruits; non-leafy vegetables; animal tissue; poultry and poultry products; dairy products; and fish and sea foods. Since blueberries were found to contain such an enormous amount of manganese (314.9 mg. per kg. dry basis) the average for fresh fruits was given both with and without the blueberry value. In typical American diets, cereals and their products contribute the largest proportion of the manganese intake.—W. H. Peterson and J. T. Skinner, *J. Nutrition*, 4: 419 (Sept.), 1931.

Absorption of Aluminum Compounds—The absorption and retention of aluminum were studied in a group of rats which were raised from weaning to maturity on a diet which contained 0.6 per cent of aluminum chloride, which is equivalent to 600 p.p.m. of the element aluminum.

After 3 months 6 rats were killed, at which time they had more than quadrupled their weight. A table shows concentrations of 0.2 to 1.0 p.p.m. of aluminum in the liver, kidneys, spleen, and testes or ovaries of rats raised on diets containing 600 p.p.m. of aluminum as compared with 0.05 to 1.0 p.p.m. the concentrations of aluminum previously found in the same organs of rats raised

on standard stock diets. This shows a difference so small as to warrant the conclusions that aluminum present in the diet is not absorbed and deposited, as has been contended by Underhill *et al.* (*Am. J. Physiol.*, 90, 1929).—Dee Tourtellotte and O. S. Rask, *Am. J. Hyg.*, 14: 225 (July), 1931.

Effect of Vitamin B Deficiency upon the Vitamin A Reserves of the Rat—It has been previously shown (*Biochem. J.*, 25: 275, 1931) that when rats are given diets rich in carotene, vitamin A may accumulate in the liver in amounts that seem great compared with the minimal daily requirements. This is a report of a further study of the effect of vitamin B deficiency upon the vitamin A reserve of the rat.

The experimental animals used were adult albino rats which had been reared to maturity on a complete synthetic diet and subsequently maintained for about 200 days upon a diet rich in carotene. Under these conditions the vitamin A reserves of the liver had been found to be remarkably constant between individuals. The rats were then exposed to diets deficient in the vitamin B complex until severe emaciation resulted, after which post-mortem examination was made both as to the extent of the remaining body fat and the amount of vitamin A still contained in the liver oils.

Rat 1 was used as a control and was kept on the complete red palm oil diet.

Rat 2 was transferred from the complete diet to one deficient in vitamin B complex which still contained red palm oil (Glaxo caseinogen 20 per cent, cane sugar 60 per cent, salt 5 per cent, red palm oil 15 per cent). On this diet the rat declined rapidly and died after 48 days. Post-mortem showed complete absence of fat depôts and general emaciation.

Rat 3 was transferred from the complete diet to one similar to that given to rat 2 except that arachis oil replaced the red palm oil, making the diet completely free from vitamins. After 35 days the rat, being extremely emaciated, was killed. Post-mortem examination revealed that the remains of the fat depôts were very scanty.

Rat 4 received the same diet as rat 3 but was killed after a longer period. There was a complete absence of intraperitoneal fat. Analyses were made separately of the liver, the intestinal tract and contents, the pelt and the remainder of the carcass.

From the results reported, it is evident that the high reserves of vitamin A which the rat is able to store in the liver when fed on a diet rich in carotene are not depleted when it is concurrently or subsequently suffering from lack of the vitamin B complex in spite of the severe drain on the body fat.—William John Dann and Thomas Moore, *Biochem. J.*, 25: 914, 1931.

CHILD HYGIENE

Health of the School Child

CHILDREN, at the time of school entrance, are very unequally conditioned physically, mentally, and emotionally. This difference arises primarily from hereditary factors, modified by social environment, nutrition, infections, and various handicaps due to accident or disease. The school has assumed that its primary function is to detect the mental differences in children and provide for their formal education in either graded or ungraded classes. This assumption is a hang-over from the old classical conception of education, namely, that the mind was the first consideration of the school and the body an encumbrance. We know now that mind and body are intimately related and that the whole child should be the concern of school authorities.

It is futile to try to force upon children the education provided by the school if handicaps, physical or mental, exist; if, for example, the child is so poorly nourished as to be hyper-excitable or easily fatigued, his mind cannot be receptive.

Ideally, there should be a progressive health program for the child from his prenatal life right to time of school entrance. If we could open the way for applying to the preschool child the technics we know would be effective, the school would be relieved of a great deal of its difficulty in classifying children and looking after defects at school entrance. Our best efforts should be concentrated upon the preschool child in order to prepare it properly for school. While the school may, in self defense, promote preschool examinations to detect defects, it is really the function of the local health department to follow all children who go to child health centers, until they enter school. It would be ideal if the completed health record of the child could accompany it right into the school. This is too much to expect, probably, in an age when migration is so constant. It is even more difficult to keep track of the preschool children than of school children.

There are, however, certain protective measures which should be carried out thoroughly for the preschool child. Vaccination against smallpox and immunization against diphtheria should be done by all means before school entrance. An unprotected child population is especially susceptible to smallpox, and it has been stated that 58.5 per cent of the deaths from diphtheria occur under 5 years of age, and 86.5 per cent under 10 years.

At this season many city health departments are issuing pamphlets regarding the health of the school child and pointing out the necessity of a thorough physical and mental examination at school entrance. A recent bulletin of the Minneapolis Division of Public Health[1] sets forth this problem of the school entrant. It states:

> The three essentials every child must have for satisfactory progress in education are: proper vision, good hearing, and the growing ability to think. Whatever interferes with these three cardinal functions results in either breakdown or unnecessarily laborious effort.
>
> The correction of existing faulty conditions, such as bad teeth and poor tonsils; the proper treatment of functional conditions such as poor nutrition, unstable nerves, and simple heart disturbances calling for the teaching, by precept and example, of proper health and social habits should not be delayed until the kindergarten age is reached. The protection of the individual against the liability to infections tending toward the establishment of disease processes may be met by such preventive measures as timely vaccination and

inoculation properly performed during the first or second year of life. If these precautions have been neglected until the kindergarten age is reached, it should be a matter of grave concern and of rectification then. Contagious diseases leave their mark upon the growth and structure and functions of the child, and frequently are handicapping millstones, dragging the child down into the mire of incomplete productiveness throughout his entire life.

In its report, *Communicable Disease Control*, a committee[2] of the White House Conference on Child Health and Protection pointed out that:

School children are the group most easily reached. The school was at one time regarded as a place of opportunity for children to contract disease. It is now known that a school with proper health supervision, ordinarily, is one of the safest places for the child.

The committee recommends early immunization against smallpox and diphtheria and, as general control measures among school children, the following:

1. Morning inspection of every child by nurse or teacher who is familiar with ordinary signs of disease
2. All suspects referred to the school physician, local health officer, or family physician for diagnosis
3. Exclude suspects and recognized cases until certified by competent authority as safe to return

A matter of prime importance during the present depression is the strengthening of child labor laws and the rigid application of their provisions. This is closely related to the school health problem. The National Child Labor Committee[3] points out that:

Cutting short children's schooling for work benefits no one. It not only limits their education but may impair their health. The competition of children in industry, moreover, tends to depress wage rates, lower standards of living, and aggravate unemployment. Even in the year 1930–1931, with millions of adults unable to find work, in 23 states and some additional cities reporting to the U. S. Children's Bureau, permits were issued to 103,000 children 14 and 15 years of age to enter industry.

It is also of great concern that this same committee is obliged to report:

Most children under 16 are so immature and reckless, so easily fatigued, and have such poor muscular coördination that no industrial employment, no work in the vicinity of machines, even when they do not themselves operate them, no employment in transportation, is free from hazard. Thousands of 14- and 15-year old children are injured in industry every year, some of them being killed or maimed for life. The only effective safeguard is to prohibit all industrial employment under 16 years.

To prevent this costly toll of industrial accidents, burdensome to industry as well as to the injured children, laws must be enacted with the support of public opinion which will keep all children under 16 years of age in school, and which will prohibit the employment of minors between 16 and 18 years of age in dangerous occupations. Such a course would serve the triple purpose of assuring to our young people a fully-rounded education, safeguarding them against industrial injury, and relieving the pressure of child competition in the employment market.

REFERENCES

1. *The Commonhealth Bulletin*, published under auspices of The Minneapolis Division of Public Health and The Health Council of the City of Minneapolis and the County of Hennepin, IX, 3 (Sept. 15), 1931.
2. Committee on Communicable Disease Control, Section II—Public Health Service and Administration, White House Conference on Child Health and Protection. *Communicable Disease Control*, 1931, pp. 9 and 96.
3. Press Release during September, 1931, National Child Labor Committee, New York, N. Y.

PUBLIC HEALTH NURSING*

Over the Top with the A. N. A.—In 1896 a little group of far sighted nurses organized themselves into the American Nurses' Association. In January, 1931, their membership numbered 86,000 when they launched a drive for 100,000 members. Early in September on the thirty-fifth anniversary of their organization at the end of the drive there were 105,000 members. This is probably the largest professional organization of the women of one country in the world.

Effectively functioning state associations in every state of the Union, in the District of Columbia and in Hawaii and Porto Rico give evidence of thorough organization. Janet Geister, Director of the American Nurses' Association, says:

> But organization is only a prelude to program. What cannot a hundred thousand nurses do! For 5 years we have been making a self study to find our true status. The first step in shaping a program has been accomplished. The diagnosis has been made. We know pretty well what our problems are. The next step is treatment. What are we going to do about it? and who shall do it? We look to the national organization for guidance and leadership. But it is the local groups, close to actual conditions, who must do the work. In the national office, plans are under way now for making practical suggestions for activities in state and district and alumnae groups during the coming year. Nursing problems are universal. They differ locally only in degree. The national office is a clearing house through which emanate committee and board actions, standards, objectives and programs. In the heart of the individual nurse lies the answer to the future of nursing. The American Nurses' Association is built out of the heart of the nurse herself working in her alumnae district and state—a glorious task, for we are meeting human needs.

—*Bull.*, American Nurses' Association, Sept., 1931.

N. O. P. H. N. Membership Drive—The increasing demands constantly being made on the special committees of the National Organization for Public Health Nursing which make studies of costs, staff education, statistics, mental hygiene, school and industrial nursing, etc., as well as additional requests for different kinds of institutes, have made it extremely necessary for the organization to extend its membership to make all these services more widely available.

It is estimated that fewer than one-fourth of all the public health nurses in the country are members of the N. O. P. H. N., and since the services of the organization cannot be duplicated by any other agency, not only every public health nurse, but every lay person interested in health conditions throughout the country should give his or her support.

Mary Sewall Gardner is chairman of a Membership Committee now being organized. The campaign starts in October and will end at the biennial convention in San Antonio, Tex., next April.—N. O. P. H. N. *News Release*, Oct. 1, 1931.

A Twenty-one Months' Coöperative Course in Public Health Nursing—This course is offered jointly by the School of Applied Social Sciences of Western Reserve University and the Cleveland Visiting Nurse Association, beginning this fall. It covers the regular 9-months program for the first year, followed by appointment to a junior staff position with the visiting nurse as-

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

sociation; it is planned for nurses who want to begin preparation for public health nursing immediately after graduating from training schools; they are given a time allowance for advanced study. In the second year there is a required seminar in public health nursing each semester, and one elective course to be chosen from the regular curriculum.

The school still continues to give an elective in rural nursing for well qualified students. This includes 3 months of rural field experience and also courses in rural sociology and rural government. The Board of Health of Lorain County, with headquarters at Oberlin, O., is cooperating with the school in giving this course (Nurses as Social Workers, *Survey* (Midmonthly), Sept., 1931, p. 556).

Public health nursing leaders will watch this experiment with interest, as they have felt that students graduating from the 9-months public health nursing courses needed staff experience before launching out for themselves; yet they were just as conscious that those nurses with staff experience alone needed a theoretical course. The new Cleveland course ought to be just the preparation we are all desiring for public health nurses.

Board Education 1931–1932—The representative of public health nursing board members on the staff of the N. O. P. H. N. is constantly asked while in the field how to educate board members, how to inform new committee members about the work and their responsibilities, and what the new trends are in public health nursing. These lay people, responsible for carrying on and promoting the work of public health nursing associations, know they cannot make a real contribution unless they are well informed.

To meet this need the Board and Committee Members' Section and the staff of the N. O. P. H. N. have outlined two courses of study, which take the form of two series of discussion topics—one for board members of urban public health nursing organizations; the other for rural or county committees.

There will be 8 topics and on the first of each month your president or chairman of the education committee, or some other person whom you designate as responsible for this program, will receive the subject for study with suggested readings and questions raised for discussion. Our hope is that the education committee will take this topic, read the references, work up a short résumé of the material and present it at board meeting, raising some of the questions for discussion, letting others come from the floor. Do not pass this job to the nurse director to do for you! She will be at the board meeting to aid in the discussion and handle the professional angles which we as lay people do not always know about or understand, but let us do the preparation ourselves. The whole trend in modern education is toward individual study and we all know that the thing we have read about or looked up for ourselves will become a part of our knowledge more readily than if some one else does the work for us.

The topics chosen for eight months are as follows:

FOR CITY PUBLIC HEALTH NURSING GROUPS

1. Generalized public health nursing programs
2. Standards and qualifications for public health nursing positions, staff education, further opportunities, etc.
3. A community health program
4. Relationship to medical profession
5. Tuberculosis nursing
6. Social hygiene as a part of a public health nursing program
7. Industrial nursing
8. Records, statistics and analysis of costs

FOR COUNTY AND RURAL GROUPS

1. A health survey of your community
2. The State department of health
3. Full-time county health units
4. Public health nursing—history and present standards and developments
5. Rural sanitation
6. Maternity, infancy and preschool program

7. School health
8. Communicable disease control—tuberculosis and venereal disease

Board members interested in receiving this series of topics to study this winter write to Evelyn Davis, National Organization for Public Health Nursing, 450 Seventh Avenue, New York, N. Y.

—Board Education 1931–1932. Board and Committee Members' Forum, *Pub. Health Nurs.*, XIII, 9: 447, 448 (Sept.), 1931.

EDUCATION AND PUBLICITY*

Lantern Slide Making—Poor lantern slides are usually worse than no slides at all. Add skill in photography to a knowledge of slide technic and the result should be photographically good slides. The "know how" is supplied by *Lantern Slides: How To Make And Color Them,* issued free by Eastman Kodak Company, Rochester.

The use of lettering calls for future discussion, but the maker of the too well known "advertising slide" cannot be trusted to produce an educational slide without detailed supervision. No one in the health field would allow a printer to lay out a page with the weird combination so common in advertising slides—several families of letters, irregular arrangement, irrelevant ornament (usually not ornamental), several colors (sometimes harmonious), all thrown together to make a picture puzzle. If not acceptable in printed form, how can we approve such material when displayed only for a few seconds?

Born: November, 1921—Ten years ago this month the first sessions of the present Public Health Education Section were held as part of the New York meeting of the A. P. H. A.

The thanks of the Section are due to the then executive secretary, A. W. Hedrich, who invited Mr. and Mrs. Routzahn to organize two sessions on health education and publicity. The JOURNAL for April, 1922, gave fairly full reports of these sessions on the topics: "Motion Pictures" and "How to Further Progress in Health Education and Publicity."

Familiar names appeared in the lists of speakers: Turner, Osborn, Ellis, Meyer, Kleinschmidt, Jacobs, Snow, Dinwiddie, Dealey, Rickards, Marcus, Evans, Miss Rose, Mrs. Routzahn; with Evart G. Routzahn serving as chairman.

At that time Dr. Lee K. Frankel was elected the first chairman of the new section which lived for several years on a provisional basis, and then was given permanent status.

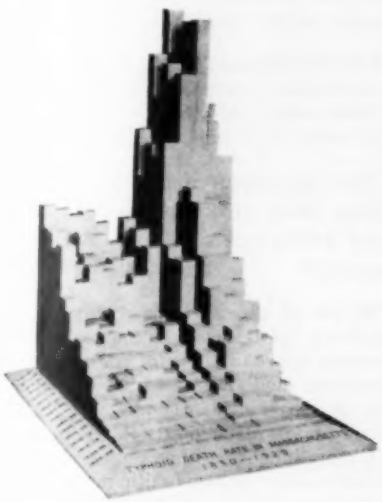
Less than 10 years after the first sessions in New York the Section was reported at Montreal to have 339 members and 44 fellows—and 10 fellows were elected in September. We are growing up.

Models, Flashing Lights and Pictures—How much there was to study at the annual meeting of the A. P. H. A. is emphasized by the record below of the displays at Health Education and Publicity Headquarters under the auspices of the Public Health Education Section.

Three solid models showing the trends in tuberculosis, diphtheria, and typhoid death rates in Massachusetts over the last 75 years. . . . They clearly illustrate in an interesting

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

manner the application of the three-dimensional graph in public health education. (Exhibited by Harvard School of Public Health.)



Copies of annual health department reports of cities, counties, and states, selected by the Sub-committee on Health Reports of the Committee on Administrative Practice of the A. P. H. A., as among the best of the year. Number of copies published, with costs, were indicated on the title pages.

Photographs of the new Deutsches Hygiene Museum of Dresden. The photographs show exterior and interior views of the museum building as well as of the vast number of wax, glass, and plaster models which it houses. They were loaned for this occasion by the Milbank Memorial Fund and by the Metropolitan Life Insurance Company, from the collection of the late Dr. Lee K. Frankel.

The White House Conference on Child Health and Protection exhibit of publications and charts.

How a health department cuts costs in the production of forms, sanitary regulations, reports, and monthly bulletins, was illustrated by the display of the Middletown, N. Y., Health Department.

"Something for idle minds in Clinic waiting rooms," exhibited by Cleveland Health Council, Ethel Hanson in charge. "Health Flashes" appeared as lantern slides or film strip, the one colored, the other uncolored.

You press a button and ring a bell, if you have selected the correct answer among four, of which only one is correct—on the Electric Questioner devised by the Racine (Wis.) Health Dept. The device is a picture frame designed to hold and display a printed card bearing a question of public health significance, and four answers—of which one is correct and three represent current erroneous beliefs. Any number of question-and-answer cards can be arranged. There is a push-button opposite each answer, and a 4-point switch allows any button to be energized while the others remain "dead," thus allowing the correct answer to appear in any desired position. A door-bell and 110–6 volt transformer completes the wiring.

An album of photographs illustrating the Shanghai anti-cholera parade organized by Dr. W. W. Peter.

A collection of diphtheria educational material shown by Marie Kirwan of State Charities Aid Association, New York.

The Clean-Up Campaign (Cleveland Health Council), Early Diagnosis and Christmas Seal Campaign (National Tuberculosis Association), Smallpox Campaign (Racine Health Department).

Educational material by National Dairy Council and Metropolitan Life Insurance Company.

A classified collection of *Better Health* and leaflets reprinted from same, by Syracuse Department of Health.

A large portfolio, the original presentation of the work of the Detroit Health Department as its winning entry in the 1930 Interchamber Health Contest.

The Syndicated Health Bulletin of the A. P. H. A.

A series of classified portfolios (National Organization for Public Health Nursing) containing well selected examples of printed matter primarily for nursing organizations but of general interest to health workers.

The 10 portfolios of classified health education samples from departments and associations, and the 50 portfolios of helps and samples of examples of many types shown by Mr. Routzahn, chairman of the Education and Publicity Headquarters Committee.

In Windsor Hall—In addition to the above the main exhibit hall at Montreal contained numerous displays of interest to readers of this department. Among these were: American Society for the Control of Cancer, *Canadian Public Health Journal*, Metropolitan Life Insurance Co., *Municipal Sanitation*, National Dairy Council, Syndicated Health Bulletin (with John

Hall, of course), Victorian Order of Nurses for Canada.

Something To Do Something About—Past Chairman Howard Green when invited to write a "message" for this department naturally emphasized a point of view he sought to bring out in our 1931 program.

> The second session of the Public Health Education Section at Montreal was designed to bring out a few of the simple facts known by other sections of the American Public Health Association and to demonstrate how these facts should be used to educate the public and to motivate it to action. Certain sections of the Association are primarily fact-finding; at least, the members of these sections are in constant touch with the newer demonstrated public health facts. Other sections of the Association are made up largely of persons whose chief duty it is to apply these facts in the demonstration of public health work.
>
> The individuals making up the Public Health Education Section are chiefly concerned with aiding the producer of facts on the one hand, and the demonstrator or utilizer of facts on the other hand, and with getting the general public, various professional groups, and others, to recognize these fundamental facts and to respect and apply them for the improvement of individual health and the protection of community life. The Public Health Education Section therefore is allied with those who know the facts and those who individually and collectively promote their use for the benefit of public health. It is a well recognized fact that the general public knows more than it *does*. The health educator has a real problem in extracting the facts, in making them available, and in making the general public not only know them but recognize their value and apply them to their daily life and to the health of the community.

A State-Wide Publicity Kit—For some years the National Tuberculosis Association has prepared "publicity kits" for the Christmas Seal and Early Diagnosis Campaigns. These have included detailed plans and much ready-made material for local use.

Now there comes from the Oregon Tuberculosis Association, Fitzpatrick Block, Portland, a kit for the fall of 1931 for county units, county nurses, county public health associations.

> This Educational Kit has been prepared as an aid to those interested in keeping the people of their county informed of the services and activities of their public health agencies.

The accompanying letter states the urgent need for more and better publicity which exists in many parts of the country:

> We are all alive to the need for exceptional effort this fall to retain in county budgets the necessary appropriations for county and school physicians and nurses. Individual jobs as well as the service generally will be at the mercy of tax-reductionists this fall.
>
> A more intelligent appreciation of the value of our county public health machinery must be instilled into the mind and heart of everyone if we are to stave off collapse in some communities. A comprehensive educational program reaching every corner of your territory is absolutely essential to bring this about. Some school and county nursing appropriations have already come under the knife.

The kit outlines a calendar for the fall months, suggesting statistical and other data illustrating the "wide range of the nurses' work," "services of volunteers," "results of services," and "cost of service."

Along with the above are specific suggestions as to the use of the material in newspapers, in talks, by handbills, charts, window displays, radio, etc.

Additional sheets suggest sources for securing data and help in preparing talks and writing copy; suggestions as to use of amateur movies and other special mediums; and offer three ready-made news stories with blanks for filling in local names and facts. A copy for *10 cents* sent to the Oregon Tuberculosis Association.

Other state associations and departments would be inclined to provide a similar service if encouraged by requests from local workers.

They Need Help—The initiative for 1931–1932 in Public Health Education Section rests upon the new group of officers—but theirs is not the whole responsibility.

Chairman, Iago Galdston, M.D., 2 East 103d St., New York, N. Y.
Vice-Chairman, Elizabeth C. Nickerson
Secretary, Raymond S. Patterson, Ph.D., John Hancock Life Insurance Co., Boston, Mass.

Section Council:

Raymond Greenman (1932)
Evart G. Routzahn (1933)
Ira V. Hiscock, Ph.D. (1934)
John Sundwall, M.D. (1935)
Clair E. Turner, Dr.P.H. (1936)

Association Committees:

Fellowship and Membership Committee, Homer N. Calver
Training and Personnel Committee, Mary S. Routzahn

A Contest in Posture—Seeking a health education plan for awards to be made on their annual Tuberculosis Field Day, the Tuberculosis and Health Society of St. Louis conducted a posture contest. Charles A. Freck of the Society describes the plan in detail:

We secured in our own office building a suite of two rooms. The larger was divided, the front half being used for a waiting room and registration room, the rear part for a dressing room. Adjoining was the photographer's "studio." We constructed a shadowgraph 6 feet square of two sheets of architect's tracing cloth behind which was a bank of 100-watt bulbs. An ordinary photographer's camera was placed 12 feet in front of this screen. Three children stood between the camera and the screen and were photographed. Instead of photographic plates, we used bromide paper which gave us excellent results although we got only a single print.

Three days were allotted; the first for boys, the second for girls, the morning of the third for colored boys and the afternoon for girls. Some 50 organizations received a handbill announcement. The whole contest was planned and promoted in 3 weeks. One hundred and seventy-five children came. No colored children entered.

The photographs were identified by means of metal house numbers which were hung above the child's head to correspond with the number placed on his registration card. After the paper was developed, photographs were separated and distributed among the examining committee of 4 physicians—2 pediatricians and 2 orthopedic surgeons—who selected the few children with the best posture. These children, 12 boys and 12 girls, were called back several days later and personally examined by the committee and the winners picked.

The back of the registration card read as follows: "I hereby give consent for the child named on the reverse side of this card to participate in the Posture Contest and agree to abide by the decision of the Judges." (Signed by parent or guardian.) This was done to eliminate criticism of the fact that the children were photographed stripped.

Silver loving cups were presented to the boy and the girl by a group of local dignitaries as a part of the Tuberculosis Day program, July 28. Each child was sent his photograph together with a chart showing excellent and bad posture and instructions for improving.

The contest was highly commended by all the medical men with whom we discussed it. We intend to give another next spring and should be able to get some interesting results therefrom. We are experimenting with other forms of photography in an attempt to get still better pictures at low cost. We wanted to keep each picture on file, the doctors wanted the pictures for reference and, of course, much of the educational value would have been lost had we not forwarded the pictures to the children, so we decided in favor of the latter. In the next contest we will use some process whereby we can get more than one print and hope to have at least 1,000 entrants.

Mr. Freck will send a copy of the chart given to the children—a letter size mimeographed sheet with 4 illustrations and simple educational material which can be used without a contest.

Important 10 Years Later—In the report of the Cleveland A. P. H. A. meeting—the first session of the newly formed Section on health education we note the following:

Dr. Lee K. Frankel, chairman of the section, in opening the meeting, referred to the need for stressing the positive message, not merely making people understand sickness and its causes, but also the value of health as such.

Where We Hope To Go—Encouraged by searching discussion among Public Health Education Section members at Montreal, Chairman Iago Galdston suggested 5 goals for 1931–1932:

1st: To contribute to the orientation in health education, by which I mean to tie together the numerous independent activities carried on, to help crystallize a policy and viewpoint and an accepted body of technics.

2d: To define better than it is at present defined the relation of our section to the others of the A. P. H. A.

3d: To render our section as useful as possible to health officers, nurses, teachers, sanitary engineers, epidemiologists, etc.

4th: To establish in conjunction with meetings of the A. P. H. A., an institute on health education.

5th: To help in arranging for the 1932 meeting of the A. P. H. A., a meaty and interesting program.

At Montreal But Not Members—A lot of people in our Montreal sessions are not members of the Public Health Education Section. We need them. We believe they need us. Please check up on health workers in your city or state—*and* do something about it.

Since July, 1923—In that month's issue of the JOURNAL was the first "Education and Publicity" department, which has since continued with but two or three issues passed by.

How to Write for the Public—Recently Dr. E. Stanley Abbot discussed the writing of popular pamphlets informally in a letter to Kathleen Larkin of the National Committee for Mental Hygiene. We quote Dr. Abbott:

Whoever is to write the pamphlets of this series should have

1. A rather vivid mental *picture of the public* to be reached by this particular series and by each particular pamphlet;

2. *Empathy*, imagination, a capacity to visualize the information, misinformation, and ignorance which the particular public will *bring to* the reading of the pamphlets, and because of that background, what that particular public not only *can get*, but probably *will get from* the pamphlets;

3. Sufficient *knowledge of facts* of mental hygiene;

4. A *sense of proportion* as between normal and abnormal;

5. A *flair* for writing simply, directly, in terms understanding of the people;

6. *Time* enough (a) to get the *facts* from those who have them, if the writer does not already have them; (b) to *weigh them* as to their mental hygiene value for the public they are intended to help; (c) to *consider beforehand* the probable effect of what the writer has in mind on the public he is writing for; (d) to *write carefully;* to *confer* many times and long times with others who know, concerning *all* these points, so as not to overlook any of the points that need to be kept in mind in writing such a series for a general public.

The general plan of getting out a series of pamphlets for the general public has, I think, almost unlimited *possibilities* for good, and so is well worth keeping at. Its *actualities* will depend upon how well its individual parts are done. I am glad you have come to see that the leading authors are not necessarily the ones to write the pamphlets. They would be if they would give the time, the thought, and the work necessary, but they won't. As you are coming to realize, each pamphlet requires a large amount of all three—time, thought, work—besides a fourth—information. Workers with concrete problems, like the teachers, have much information, and some among them are willing to give time, thought and work. But information in other fields which border theirs, and a broader outlook than they are likely to have, are also needed. That broader outlook *you* will have to have—you may have it yourself or may add to what you have by getting it partly from one person, partly from another, thus gradually building it up. I am only trying to give you my little bit to add to what you have. This broader outlook you can then contribute to these coöperators with you in the general plan. It takes time to get it over to them. But when got over, it will be worth much to them as well as to you for the pamphlet series.

All your coöperators have a great deal to learn. We all have. This is one of the troubles. We don't know as much as we need to know in order to write these pamphlets. So don't get discouraged if it takes time, and time, and time to get out even one pamphlet! To get out a really good one is worth it.

BOOKS AND REPORTS

Principles of Sewage Disposal—Bulletin No. 12—*Division of Municipal and Industrial Research, Massachusetts Institute of Technology, Cambridge, Mass.*

This is an 8-page booklet giving the principles of sewage disposal, starting with the necessity of sewage disposal, the classes of sewage, including industrial wastes, and the purposes of sewage treatment processes. The necessity of sterilization of effluent is covered and the extent of sewage treatment required is discussed.

An outline of sewage disposal processes discusses: (1) preliminary methods (screens, grit chambers, plain sedimentation and chemical precipitation); (2) intermediate steps (single-story septic tanks and Imhoff tanks); (3) final treatment (broad irrigation, intermittent sand filtration, contact filtration, trickling filtration, and activated sludge).

The adaptation of the several methods and the question of ultimate disposition of sewage or sewage effluent are briefly covered.

VINCENT B. LAMOUREUX

Tenth Annual Report of Ohio Conference on Water Purification, Columbus, O., October 14–15, 1930.

The tenth annual report of the Ohio Conference on Water Purification is prepared in its usual style so helpful to the busy reader in that short abstracts of the main papers are included in the front. Round table discussions of plant problems covered many phases of activity, including difficulties encountered due to clogging strainers and intakes, reduction of waste by metering and leakage surveys and descriptions of how to make blueprints of reports and a rain gauge. The longer papers range from talks on water softening, iron removal, lime as a purification agent, use of ammonia-chlorine process, to suggestions regarding laboratory procedure and media. ARTHUR P. MILLER

Preventive Management: Mental Hygiene in Industry—*Edited by Henry B. Elkind, M.D. New York: B. C. Forbes Pub. Co.*, 1931. 234 pp. Price, $3.00.

This medium sized volume in large easy reading print is made up of a number of chapters by certain well known writers in the field of industrial psychology and relations, and is an adaptation of a course of eight lectures conducted in the spring of 1930 under the auspices of the Massachusetts State Department of Education in coöperation with the Massachusetts Society for Mental Hygiene. The various authors and their contributions are: Meyer Bloomfield, lawyer, "The Next Step in Industrial Relations"; Ordway Tead, industrial consultant and editor, "Human Nature and Management"; V. V. Anderson, M.D., "Psychiatry in Industry"; Henry B. Elkind, M.D., "Practical Applications of Mental Hygiene in Industry"; Harlow S. Person, author and director of the Taylor Society, "Mental Pitfalls of Leadership"; Karl M. Bowman, M.D., "The Industrial Aspects of Morbid Emotion and Fatigue"; Abraham Myerson, M.D., "Fear and Nervous Energy"; and Elliott Dunlap Smith, lawyer, "The Minor Executive and Mental Hygiene"; with a foreword by Henry P. Kendall, President of the Kendall Company, Boston. While so many writers have stated their respective viewpoints upon a more or less common problem, there is, in fact, very little overlapping.

A unique feature which the reviewer considers quite commendable is the

matter of prefacing each article with a page write-up of its author and his principal achievements, from which the reader can certainly derive a better grasp of the respective viewpoint.

The general theme is that wherever human affairs have been organized to accord completely with the idea that prevention is better than cure, progress has been made. The essence of scientific management may be regarded as an attitude, not simply a performance, and involves both the working man and the management for its success.

The discussion is aimed to be on a non-technical level from which it may appeal not only to the technician and expert in industry, but also to the average executive and foreman. A commensurate bibliography of several pages devoted to articles and books which have appeared in the field within the last 10 years is added as an appendix, while there is also a fitting index.

The symposium makes interesting reading without the verbosity which commonly accompanies many articles in mental hygiene and may be regarded as an exemplary presentation of current thought upon an important subject.

E. R. HAYHURST

Occupation and Health—*An Encyclopaedia of Hygiene, Pathology and Social Welfare—Published by the International Labour Office, Geneva. Distributed in the United States by the World Peace Foundation, 40 Mt. Vernon St., Boston.* (2 vols.) Vol. I, 1000 pp. 181 ill. A–H. Price, $12.00 per vol.

This encyclopaedia of industrial hygiene has a useful place in the office of every industrial health or medical service, and in the office of every city and state health department which is concerned with problems of industrial hygiene. The first volume is now ready. It is the work of about one hundred of the best known experts in the field of industrial health. Its statements are concise and expressed in as simple a form as is consistent with scientific accuracy. It deals with three main groups of questions: (1) the work, (2) the worker, (3) the environment.

An illustration of the types of subjects treated may be seen in the following brief section from the table of contents: Acids, Acridine, Acrolein, Actinomycosis, Agricultural labourers, Air. It will be seen that topics include harmful substances, diseases, occupations and harmful conditions of the environment. Each cause of disease is discussed on a uniform plan including the following sub-divisions: Chemistry or biology, Sources of poisoning or infection, Uses of the dangerous product, Mode of action, Statistics, Symptoms, Diagnosis, Method of detection in the environment of the individual, Legislation, Bibliography. The occupational diseases are treated in an equally logical manner, as are also the various environmental conditions.

This document is the most complete and reliable reference work of its type.

C. E. TURNER

Principles and Practices in Health Education—*Report of the Sixth Health Education Conference, American Child Health Association at Sayville, Long Island, June 16–21, 1930. New York: American Child Health Assn.*, 1931. 485 pp. Price, $1.50.

Reporting, almost verbatim, a week's discussion of problems in health education, the American Child Health Association has given educators a most useful volume for reference and teacher preparation. This 1930 Sayville conference, as well as the preceding and similar five, has been generously participated in by specialists. With stenotypist accuracy, the spontaneity of their extemporaneous remarks as well as the firmness of their prepared work is retained and made available. Through

intelligent editing the substance of each contribution is retained intact so that the reader catches the intimacy of the sessions without the mind wanderings so generally observed in stenotypist accounts.

Expressing the theme of the conference as a search for basic principles for health education, Dr. W. H. Kilpatrick presents one of his inimitable philosophical treatises outlining the traditional, the scientific, and the dynamic approaches to teaching. Through his statements that "life is a compound of recurring and unpredictable elements," he gives philosophical foundation for suggestions appearing later in the report relative to dynamic curriculums based upon personal problems. This paper of Kilpatrick's with those of Dr. P. M. Symonds on the Psychology of Learning, Drs. Ned Dearborn and Charles Russell on Teacher Preparation, and Dr. T. D. Wood on the Essentials of a School Health Program, alone, makes the volume important.

The enormous number of contributor-specialists makes it impossible to review each. To suggest outstanding sections is difficult because of the divergence of material and general excellence of the comments. One reads, for example, concrete plans for curriculum construction cited by Principal Manley of Springfield, Mo., County Supervisor Nettie Brogdon of North Carolina, Extension Director Maud Brown of Iowa, and Health Education Director Schmoyer of Lynn, Mass., Dr. C. L. Brownell on Physical Education, H. J. Stack on Objectives in Safety, M. A. Bigelow on health conduct and interdepartmental administration, Haven Emerson on health service, Anne Whitney on integration of instruction, Raymond Franzen on evaluating outcomes, and Joy Morgan on progress in health education.

The book is conveniently divided into chapters according to the conference sections. At the end a summary chapter on high points, lacking only the concreteness such as will eventually emerge from health education discussions of this kind, presents the principles arrived at during the deliberations.

The volume is encyclopedic and will indispensably supplement modern books on specific phases of health education.

D. OBERTEUFFER

Manual of Tuberculosis for Nurses —*By E. Ashworth Underwood, D.P.H. New York: Wood,* 1931. 272 pp. Price, $2.50.

In the author's own words, "the aim of this manual is to provide, in convenient form, the information which is likely to be required by nurses who are engaged in the hospital management of tuberculosis cases, and also to meet the needs of those who are preparing for the final examination for such qualifications"—i.e., the qualifications for the Certificate of the Tuberculosis Association. Because of the particular purpose for which the book was written, the procedures therein are restricted to local methods and conditions and would be, no doubt, seriously questioned in other countries. Therefore it cannot be used as a guide for nurses generally.

This is to be regretted, for there are few sources of information about tuberculosis which give as complete and yet as simple, logical and clear explanations of terms, progress of the disease, treatments and procedures. It is perfectly clear to anyone, nurse or lay person, the reason for each statement the author makes, because of the unusually logical development of each topic.

The social phases of tuberculosis are well explained. If the author had spent less time upon elementary nursing procedures, such as how to take a temperature and give a bed bath, and had given more definite instructions regarding concurrent disinfection and home care, the book would be more valuable for nurses

called upon to give care to the tuberculous in their homes.

It is to be hoped that the part pertaining to procedures and treatments may be made to apply more generally, for then the book would be a great aid to both private and public health nurses. The paragraph headings, indexed as they are, make for ready reference. The summaries at the end of the chapters are mines of information. The book is well printed, easy to read and nicely bound.

VIRGINIA A. JONES

Accidental Injuries. The Medico-Legal Aspects of Workmen's Compensation and Public Liability—*By Henry H. Kessler, M.D. Philadelphia: Lea and Febiger,* 1931. 718 pp. Price, $10.00.

The intensively busy manufacturing State of New Jersey including its great chemical industries has provided the author a rich field for 11 years' experience as medical director of the state's rehabilitation clinic, the first one in the country, coupled with his former capacity as medical adviser of the compensation bureau.

The present work is based on an experience of more than 63,000 cases personally examined and a close following of foreign experience, especially as described by that of L. Imbert. It stands unique among American texts and may be expected to fill a decided want for physicians, lawyers, employers, insurance companies and industrial accident boards and commissions for guidance as conceived by an orthopedic surgeon and industrial hygienist who is constantly dealing with the medico legal features of accident and disease cases. The Foreword is by the well known surgeon, Dr. Fred H. Albee, Chairman of the New Jersey Commission on Rehabilitation.

The first 7 chapters comprise an historical review, the medical aspects of workmen's compensation laws, the basis of scheduling injuries, the general pathology and end-results of trauma, and the criterions of temporary and permanent disability. The next 10 chapters are devoted to trauma of various parts of the body with pertinent anatomico-physiological discussions and evaluations, usually in percentage, of damage and disability suffered. Chapter XVII on Injury and Disease deals in a masterly way with this most controversial topic and is followed by a short chapter on Traumatic Neuroses. Disturbance of function is recognized as the key to compensation and attempted rehabilitation.

Hygienists will be particularly interested in Chapter XIX, which devotes 124 pages to occupational diseases, stressing the medico legal aspects of foreign and domestic legislation with tables of schedules, matters of arbitration, the fixing of responsibility and the evaluation of disability. Some 28 pages, devoted to lead poisoning, present summaries of 213 cases in the author's series but also extensive inclusions from others, much of which is in classified and tabular form. There follow commensurate discussions of the other common industrial poisons, anthrax, radium, the dermatoses and silicosis. The final chapter is devoted to rehabilitation of the physically handicapped.

The work is essentially the author's own, who writes as one thoroughly versed in his subject and widely experienced in practice. Extensive bibliographies are appended throughout for those who would seek further. Numerous fine half-tone figures illumine the text. Tables, court decisions and case citations abound.

Health conservationists will be interested in the author's plea for a public negligence law to provide compensation for non-industrial accidents and other disabilities suffered indirectly as the re-

sult of modern congestion, speed of activity, and a chemico-mechanistic existence. EMERY R. HAYHURST

Asthma and Hay Fever in Theory and Practice—*By Arthur F. Coca, Matthew Walzer, and August A. Thommen. Springfield: Charles C. Thomas,* 1931. Price, $8.50.

The authors have thought it necessary to explain the publication of another book on the general subject of allergic diseases, since several have appeared within the last year. There can be no question that specialists and general practitioners alike are coming to recognize the importance of allergic phenomenons, not only as seen in special diseases, but also following the administration of the many biological preparations which are now so widely employed in the practice of medicine. We feel that there is no need for the explanation of the authors, since all authoritative knowledge on the subject will be welcomed.

Recognizing that any one man would find extreme difficulty in covering such a subject thoroughly, the book has been written by three authors, all attached to the same school: Part I: Hypersensitiveness, Anaphylaxis, Allergy, by Arthur F. Coca, M.D.; Part II: Asthma, by Matthew Walzer, M.D.; Part III: Hay Fever, by August A. Thommen, M.D. Chapter XVII is the combined effort of Walzer and Thommen, while Katherine Bowman is the joint author of Chapter XVIII.

A work of this sort does not lend itself readily to a detailed review. Each part is introduced by an historical section and followed by an excellent bibliography. The book is concluded with a good general index and a special index of Atopens and Excitants.

In general it may be said that each author has covered his subject in an authoritative manner, which leaves little or nothing to be desired as far as our present knowledge goes. The third part is especially well illustrated with photographs of trees, grasses, weeds, and their pollens. Even if one has a reasonable familiarity with the general subject, he will be astonished at the great number of excitants to which certain people are sensitive.

The book is well printed, although there are some typographical errors. Unfortunately, heavy paper has been used. It can be commended as one of the most complete treatises on the subject, and the names of the authors insure the accuracy of its statements.

M. P. RAVENEL

Population Problems—*By Warren S. Thompson, Director of Scripps Foundation for Research in Population Problems, Miami University. New York: McGraw-Hill,* 1930. Price, $3.75.

The first book is written largely from the standpoint of economics and sociology. Public health as such is not considered, though one chapter is devoted to Famine and Disease as Factors in Population Growth. A number of other important matters which affect public health are treated from the same aspect, such as the relation of overpopulation to unemployment, the teaching of the churches based on the biblical injunction to "be fruitful and multiply, and replenish the earth," and the action of states which encourage the increase in population on account of military power.

The author correctly holds that those who raise families are penalized economically, and believes it is high time to consider the "compensation of mothers as mothers."

The effect of the feeble-minded on the population is well treated under the chapter devoted to The Problem of Quality. Other subjects of interest are: make-up of population, future growth in the United States, world-wide trends,

the effects of migration, emigration, and immigration.

The book is well balanced, but we wish to commend particularly the chapter on The Negro in the United States, which strikes us as being an unusually sane presentation of a vexed question.

The book is written in a very attractive manner. It contains a great deal of history, and each chapter is full of interest. The printing and binding are excellent. There are a good bibliography and an index. M. P. RAVENEL

International Studies on the Relation between the Private and Official Practice of Medicine with special reference to the Prevention of Disease—*By Sir Arthur Newsholme. Vol. II. Baltimore: Williams & Wilkins,* 1931. 249 pp. Price, $4.00.

The second volume of Sir Arthur Newsholme's *International Studies,* conducted for the Milbank Memorial Fund, follows closely upon the first (see September JOURNAL, page 1076). It deals with a group of countries whose programs are less helpful as potential guides for American progress but which are essential to the general picture of European experience.

In Belgium, the bulk of health work of the more progressive types is carried by voluntary organizations for infant welfare, and the control of tuberculosis and venereal disease, which are somewhat unfortunately split up along racial and religious lines. Sir Arthur highly commends the program for the control of alcoholism and the scientific application of medicine in the field of penology. Sickness insurance is at present voluntary but likely to be made compulsory by impending legislation.

In the next two nations represented, France and Italy, we find a high degree of governmental and social centralization and relative backwardness in the development of health and social services. France has very recently enacted a law providing for sickness insurance, while Italy has not as yet done so except for tuberculosis. In both countries the highly centralized system of government has proved a serious block to local health progress, and in France the reactionary attitude of the powerful medical trades unions has proved an even more serious obstacle. The insistence of the medical syndicates upon the control of dispensary patients by the family physician and upon professional secrecy in its extremest form has made not only public health progress but even the collection of adequate vital statistics exceedingly difficult. The medical profession has endorsed the new sickness insurance act by a vote of 8 to 1, but insists on payment for services rendered and not on a capitation basis. The brightest spot in the picture is the work of the Office d'Hygiene Sociale in the fields of tuberculosis, venereal disease and child welfare.

In discussing Italy, Sir Arthur points out the difficulties due to extreme centralization, all provincial health officers being appointed from Rome and local health work being very elementary except in the large cities. He rightly elaborates on the splendid work done in Milan, which has one of the finest systems of school medical inspection in the world, and has reduced its general death rate from 32.8 in 1878 to 12.5 in 1927. A fuller consideration might well have been given to the splendid work done in recent years in the control of malaria throughout Italy.

Hungary is a country seriously hampered by economic stringency and a somewhat cumbersome governmental system. The outstanding achievements are the magnificent Hygienic Institute of Bela Johan and the work done for maternal and infant welfare by the Stefania Society (a voluntary organization with considerable government subsidies). The tuberculosis death rate

was still 260 per 10,000 in 1925. Private medical practice has almost disappeared and doctors are woefully underpaid, as a result rather of the general economic condition than of faults in the National Insurance Act.

Czechoslovakia, Jugoslavia and Poland give us the picture of nations created since the war with comprehensive and modern systems of public health and social insurance but hampered in many ways by economic limitations. Sickness insurance in all is compulsory, and treatment is largely carried on in clinics with little free choice of doctors in Czechoslovakia and Jugoslavia, and too much "wandering" from doctor to doctor in Poland. The Czechoslovakia program is particularly notable for the successful coördination of voluntary health activities under a National Council of Social Hygiene.

In Poland the School of Hygiene and the central Nursing School in Warsaw are outstanding beacons of progress and local health centers are being developed throughout the country with marked success.

In Jugoslavia there is a somewhat similar program, Hygienic Institutes at 9 provincial centers, smaller health institutes (80), and still smaller village stations (500). The latter are of a very primitive character, providing chiefly for bathing facilities and medical care rather than public health work in our sense; but the effort to bring the fundamentals of modern sanitation and medicine to all parts of so primitive a country is one of the boldest and finest ever made in any country. Sir Arthur deals only with the work in Croatia. If he had seen it under the vastly more difficult conditions of the Macedonian mountains, his admiration would have been even greater.

It is a source of legitimate pride to America that in the work of the Office of Social Hygiene in Paris, the anti-malaria work of Italy, the Hygienic Institutes and health centers of Czechoslovakia, Hungary, Jugoslavia and Poland, the aid of the Rockefeller Foundation has played an important part.

C.-E. A. WINSLOW

Essays on Population—*By James A. Field. Edited by Helen Fisher Hohman. Chicago: University of Chicago Press,* 1931. Price, $3.50.

This volume is as it were a memorial to the author, who died in 1927. Like the book, *Population Problems,* by Thompson, it also is written from the economical and sociological standpoints and contains much very interesting history. It is made up of a series of essays, the longest of which is on the Malthusian Controversy in England.

Some of the essays have been compiled by the editor from manuscript notes, and some reprinted. The book is well written and extremely interesting, though some of the essays date back as far as 1906; and others, though of later date, such as those on eugenics and birth control, do not take cognizance of the progress which the world has made since they were written.

There is a Foreword by James Bonar, LL.D., and an Editor's Preface, followed by a biographical sketch of the author.

The printing and make-up are excellent.

M. P. RAVENEL

Proceedings Fifth Annual Conference, Maryland-Delaware Water and Sewerage Association, Wilmington, Del., May 5–6, 1931.

The proceedings of the fifth annual Conference of the Maryland-Delaware Water and Sewerage Association dealt with the water supply problems confronting the municipalities of these two states. The water supply of Wilmington, Del., was discussed in three papers, one on the pollution of Brandywine Creek by Willem Rudolfs, and others on the history of the supply and new dam

construction. Other papers included filter plant problems, small town water works, odor and taste control, and regional planning.

Two very important papers discussed the troubles in Maryland created by the drought of 1930, watershed cover and water conservation. The question box covered a number of problems on water works and sewerage construction and plant operation.

VINCENT B. LAMOUREUX

BOOKS RECEIVED

YELLOW FEVER. AN EPIDEMIOLOGICAL AND HISTORICAL STUDY OF ITS PLACE OF ORIGIN. By Henry Rose Carter. Baltimore: Williams & Wilkins, 1931. 308 pp. Price, $5.00.

NUTRITION AND PHYSICAL FITNESS. By L. Jean Bogert. Philadelphia: Saunders, 1931. 554 pp. Price, $3.00.

PERSONAL HYGIENE APPLIED. 4th ed. Jesse Feiring Williams. Philadelphia: Saunders, 1931. 520 pp. Price, $2.25.

THE TRAINING OF SOCIAL WORKERS. By James Edward Hagerty. New York: McGraw-Hill, 1931. 205 pp. Price, $2.50.

PRINCIPLES AND PRACTICE OF HYGIENE. A Textbook for College Students. Philadelphia: Blakiston, 1931. 251 pp. Price, $1.75.

THE LUNGS AND THE EARLY STAGES OF TUBERCULOSIS. By Lawrason Brown and Fred H. Heise. New York: Appleton, 1931. 151 pp. Price, $1.50.

TABLES OF FOOD VALUES. By Alice V. Bradley. Peoria: Manual Arts Press, 1931. 128 pp. Prcie, $2.00.

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY, Vol. VII. Baltimore: Williams & Wilkins, 1931. 441 pp. Price, $10 00.

THE GREAT PHYSICIAN. A LIFE OF SIR WILLIAM OSLER. By Edith Gittings Reid. New York: Oxford, 1931. 299 pp. Price, $3.50.

JUNGLES PREFERRED. By Janet Miller. New York: Houghton Mifflin, 1931. 321 pp. Price, $3.50.

SIMPLE LESSONS IN HUMAN ANATOMY. By B. C. H. Harvey. Chicago: American Medical Association, 1931. 434 pp. Price, $2.00.

THE SCIENCE OF HUMAN LIVING. By Mae Johnson Corwin. San Francisco: Harr Wagner, 1931. 450 pp. Price, $1.68.

MASTODONS, MICROBES AND MAN. 2d ed. By W. W. Peter. New York: Cleanliness Institute, 1931. 27 pp.

LACTOBACILLUS ACIDOPHILUS. AN ANNOTATED BIBLIOGRAPHY TO 1931. By W. D. Frost and Hazel Hankinson. Milton, Wis.: Davis-Greene Corp., 1931. 160 pp. Price, $1.00.

LEAGUE OF NATIONS. HEALTH ORGANIZATION. HOUSING AND MALARIA. By Clayton Lane. Boston: World Peace Foundation, 1931. 43 pp. Price, $.40.

LEAGUE OF NATIONS. HEALTH ORGANIZATION. EUROPEAN CONFERENCE ON RURAL HYGIENE. Boston: World Peace Foundation, 1931. 62 pp. Price, $.50.

MALARIA CONTROL BY ANTI-MOSQUITO MEASURES. By Gordon Covell. Calcutta: Thacker, Spink & Co., 1931. 143 pp. Price, $2.00.

A SHORT HISTORY OF NURSING. 3d ed. By Lavinia N. Dock and Isabel M. Stewart. New York: Putnam, 1931. 404 pp. Price, $3.00.

THE HISTORY OF PAEDIATRICS. By George Frederic Still. New York: Oxford, 1931. 525 pp. Price, $8.00.

PAYING YOUR SICKNESS BILLS. By Michael M. Davis. Chicago: University of Chicago Press, 1931. 276 pp. Price, $2.50.

LEAGUE OF NATIONS. HEALTH ORGANIZATION. REPORT OF THE LABORATORY CONFERENCE ON THE SERODIAGNOSIS OF SYPHILIS. Boston: World Peace Foundation, 1931. 131 pp. Price, $.80.

NUCLEIC ACIDS. By P. A. Levene and Lawrence W. Bass. New York: Chemical Catalog Co., 1931. 337 pp. Price, $4.50.

GOVERNMENTAL REPORTING IN CHICAGO. By Herman C. Beyle. Chicago: University of Chicago Press, 1931. 303 pp. Price, $4.00.

BOOKLET ON GROWTH, BOOKLET ON HABITS, BOOKLET ON PERSONALITY, BASED ON REPORTS OF THE WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION. Prepared by Marion Lyon Faegre. St. Paul: Farmer's Wife, 1931. Price for the set, $.45.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Preventive Medicine—A stimulating discussion of the interrelationships between public health and preventive medicine in private practice, and the opportunity of the county unit to foster sound health administration.

ARMSTRONG, D. B. Adequate County Health Organization, Tuberculosis Control and the Medical Profession. New England J. Med., 205, 12: 569 (Sept. 17), 1931.

Tuberculosis in the Rural South—Although tuberculosis is definitely lower in children of southern rural districts than in a typical northern city, the increase of infection with age is similar in trend. Of colored children 60 per cent reacted, whereas only 51 per cent of the white children from 5 to 9 gave evidence of infection.

ARONSON, J. D. Incidence of Tuberculous Infection in Some Communities of the South. Am. J. Hyg., 14, 2: 374 (Sept.), 1931.

Public Health Pioneering—British opinion commending the trial of new hygienic projects by local authorities in a country where health administration is much more standardized than in our own.

BUCHANAN, G. Some Recent Policies Regarding Particular Diseases. Brit. M. J., 3684: 283 (Aug. 15), 1931.

Coal Mining and Tuberculosis—Though the coal miner has a relatively low death rate from tuberculosis, the death rates (in Great Britain) from bronchitis are high. The discussion of the phenomenon has much of value to American sanitarians.

CUMMINS, S. L. Coal Miners and Tuberculosis. J. State Med., 39, 9: 526 (Sept.), 1931.

Finding Childhood Tuberculosis—Opportunities open to the public health nurse are suggested in this clear account of diagnostic measures.

EDWARDS, H. R. Tuberculosis in Children. Pub. Health Nurse, 23, 9: 402 (Sept.), 1931.

When Death Rates Go Up—This absorbing dissertation on the real meaning of death and birth rates and population figures, intended for the intelligent layman, has plenty of meat for the viewers-with-pride among our ebullient statisticians.

FAIRCHILD, H. P. When Our Death Rates Go Up. Survey Graphic, 66, 11: 510 (Sept.), 1931.

Tuberculosis in Tennessee—Chief among the features of this program are case-finding clinics, consultant service, nursing follow-up, and study of hospital needs. The first is discussed in detail. A program that would be applicable to most states it would seem.

GASS, R. S., and BISHOP, E. L. Tuberculosis Control in Tennessee. J. A. M. A., 97, 12: 843 (Sept. 14), 1931.

Experimental Epidemiology—Another demonstration of herd reaction to infection by Greenwood's mice.

GREENWOOD, M. Factors Determining the Difference Between an Epidemic of One Disease and that of Another. Brit. M. J., 3683: 231 (Aug. 8), 1931.

In the Cause of Health Education—Reasons why physicians ought to use their influence toward improving the health courses in public schools.

IVY, A. C. A Deficiency in Present Day Education. J. A. M. A., 97, 9: 588 (Aug. 29), 1931.

Medical Societies and Public Health—Pleading for more efficient participation in public health administration by county medical societies, the author makes some bald statements that

might be challenged, but the value of the proposal is not to be doubted.

McLAUGHLIN, A. J. The Medical Profession and the Public Health. Pub. Health Rep., 46, 35: 2041 (Aug. 28), 1931.

A County Health Survey—Recommendations for improved service based upon this survey of a southern county health department would apply to most administrative units, large or small.

MOUNTIN, J. W. Public Health Service in Knox County, Tenn. Pub. Health Rep., 46, 34: 1981 (Aug. 21), 1931.

Community Public Health Nursing—A complete answer to the question: what is public health nursing? The problems of community organization are given a thorough airing.

NELSON, S. C. How Public Health Nursing Can Best Serve the Community. Mod. Hosp., 37, 3: 128 (Sept.), 1931.

About Tuberculosis Prevention—In this progress report of the Massachusetts 10-year plan are many practical conclusions. A definite relation exists between the adult tuberculosis death rate, per cent of child reactors and cases of tuberculosis in school children. Exposure in the home is the most potent factor in producing childhood infection. There is much more.

POPE, A. S. The Discovery and Prevention of Tuberculosis in the Community. J. A. M. A., 97, 12: 846 (Sept. 19), 1931.

Further Experience with BCG Vaccine—From Canada comes more evidence in support of the immunizing value of BCG vaccine.

RANKIN, A. C. BCG Vaccine. Canad. Pub. Health J., 22, 9: 459 (Sept.), 1931.

British Views on Sex Education—Excellent indeed is this presentation of the need for better sex education by a British churchman addressing an annual meeting of the British Medical Association. Imagine the A. M. A. including this subject from such an ecclesiastic source.

PYM, T. W. The Need of Education in Questions of Sex. Brit. M. J., 3682: 186 (Aug. 1), 1931.

Anti-Vivisection Answers—Another well-thought out, logical, and eminently sound statement refuting the mouthings of the anti-vivisectionists. Useful reference material.

REED, C. I. Animal Experimentation. Ill. Health Quarterly, 3, 3: 204 (July-Sept.), 1931.

Vision Conservation—What nurses should know about eyesight conservation is told in this symposium, and this information should be a part of the equipment of other health workers.

ROYER, B. F., *et al.* High Lights on the Conservation of Vision. Am. J. Nurs., 31, 9: 1077 (Sept.), 1931.

Research in Public Health—Recounting the progress and methods of research carried on by the Chicago Department of Health through its laboratories.

TONNEY, F. O. Success in Public Health Research. J. A. M. A., 97, 10: 700 (Sept. 5), 1931.

Health Education in Rural Schools—A straightforward account of a job well done under primitive conditions and with only the tools at hand.

WOODBURY, M. C. Health Education in the One-Room School. Pub. Health Nurse, 23, 9: 415 (Sept.), 1931.

More Tuberculosis Case-Finding Research—Further findings of the important 10-year program in Massachusetts. One school child in a thousand is found with adult type tuberculosis; a quarter of these are dead after five years. The implications of the whole findings are discussed.

ZACKS, D. What We Have Learned in Massachusetts from the Ten-Year Program. New England J. Med., 205, 11: 525 (Sept. 10), 1931.

NEWS FROM THE FIELD

THE 300,000TH LEITZ MICROSCOPE

THE Optical Works of E. Leitz, in Wetzlar, Germany, have completed their 300,000th microscope. This instrument was presented at an appropriate gathering to Geheimrat Professor Dr. Ludwig Aschoff, of Freiburg, in Breisgau, Germany, a scientist and physician of world renown in the pathological and anatomical field of scientific endeavor.

The dedication of this microscope follows a custom of the firm of E. Leitz to present every 50,000th microscope to an outstanding scientist or institute, thus expressing their appreciation of the cooperation extended by leading authorities to the Leitz Works.

The 100,000th microscope was presented to Dr. Robert Koch, of Berlin, and the 150,000th to Dr. Paul Ehrlich, of Frankfurt.

DRUG CONTROL POLICY UNCHANGED

THERE will be no changes in the policy of the Food and Drug Administration of the U. S. Department of Agriculture pertaining to enforcing the present drug control law, says Dr. F. J. Cullen, the newly appointed chief of drug control.

"Inquiries as to possible changes in drug control policy in enforcing the law have been received, and I take this occasion to state that it is the purpose of the administration, in its regulatory work with drugs and medicinal preparations, to continue vigorously its program of action under the food and drugs act against medicinal preparations falsely and fraudulently represented by label or circular accompanying the package as preventives or treatments for disease conditions."

CHILD HEALTH CONFERENCE ORGANIZED

A COMMISSION of 16 members to study the problems of child health and protection in Iowa was appointed June 9 by Governor Turner. Two conferences have already been held, section and subcommittee chairmen appointed, and plans made to study the entire field of child welfare work in the state and to work out plans for coördination and more efficient operation of the various projects and activities.

MISSOURI DROUGHT AREA RELIEF

THE drought area of Missouri has been divided into 5 districts of 9 counties each, for the administration of the state's share of the $2,000,000 appropriated by Congress for the U. S. Public Health Service in drought areas. Each district will have a physician, a sanitary engineer, a laboratory technician and 5 nurses.

NEW LEGISLATION IN SWEDEN ON MATERNITY BENEFITS

A ROYAL decree of June 26, 1931, makes provision for the first time in Sweden for the payment of maternity benefits from the national treasury to women, whether married or single, who do not belong to sickness insurance funds and whose income, whether singly or together with that of their husband, is below a certain amount.

The benefit of one krona (26.80 cents) a day is paid for 30 days on the condition that the woman abstain from employment; women who are protected by the labor law and who are by that law required to stay away from work for at least 6 weeks may receive the benefit for 56 days.

The benefits are paid on application to the sickness insurance funds. Each applicant is sent information on the proper care of herself and the child. Midwives' services or hospital care may be provided on request, but a deduction is made from the maternity benefits for such services.

This decree is to become effective by a special proclamation of the King.—*Svenska Författningssamling*, Stockholm, No. 279 (July 4), 1931.

MUTUAL AID FUNDS FOR SCHOOL CHILDREN IN ITALY

A SYSTEM of mutual aid societies was instituted in the Italian schools a few years ago. The societies are under the supervision of a national organization. Their object is to provide medical aid and country vacations for school children and to take measures for preventing sickness and for promoting knowledge of legislation relating to health and social welfare. The money for their support is contributed by the National Social Insurance Fund. Membership is optional for children in the schools, and each child who joins pays an annual fee of about 5 lire (26 cents). This money is saved and when the child reaches the age of 20, it is transferred to his credit in the fund for invalidity and old-age insurance, which is compulsory in Italy for a large majority of the workers; if he is not subject to insurance, it is credited to his account in a savings bank.—*La Stirpe*, Rome, Apr., 1931.

FRENCH DENTAL CLINIC FOR SCHOOL CHILDREN

A DENTAL clinic for school children will be established in the city of Paris. The cost of construction will be covered by a gift from an American philanthropist; the expense of maintaining the clinic will be supplied by the city. This will be the first institution of its kind in Paris; heretofore only 10,000 out of the 250,000 school children were given free treatment in the hospitals and schools of dentistry. Under the new system children will have their teeth examined 3 or 4 times a year and will be sent for treatment to the new clinic.—*Revue Internationale de l'Enfant, Geneva*, Apr., 1931, p. 409.

NATIONAL CHILD WELFARE BUREAU, COSTA RICA

A COSTA RICA law of August 15, 1930, provides for the establishment of a governmental bureau for child welfare work (Patronato Nacional de la Infancia). Emphasis is placed on the protection of the child's health and on watching the conditions of his mental, moral, and social life. Work for the prevention of maternal and child mortality and for the prevention of disease is also among the functions of the bureau. The bureau will prepare plans for the establishment of health resorts, playgrounds, hospitals, and other institutions for children; it will also supply information and advice on child welfare matters and watch over the enforcement of the child welfare laws. A special section enumerates in detail the various subjects which the bureau is expected to study.—*Boletín del Patronato Nacional de la Infancia*, San José, Costa Rica, 1, 1, 1930.

CHILD WELFARE CONGRESS

THE first National Child Welfare Congress of Costa Rica was held in the capital, San José, April 26–May 3, 1931, under the auspices of the recently established National Children's Bureau, which is a branch of the National Government.

A number of papers were presented dealing with various phases of child welfare, for instance, infant mortality, health of mothers and children, school attendance, physical education of school children, and juvenile delinquency.

Many resolutions were passed on the

above subjects. The Congress has asked the government to appoint a committee for drafting bills on juvenile courts, child labor, adoption, children of illegitimate birth, marriage and divorce, and to introduce these bills into the National Legislature in 1932.—*La Gaceta* —Diario Oficial, San José, Costa Rica, May 24 and June 19, 1931.

LEAGUE CALENDARS FOR 1932

AN unusually artistic wall calendar is beng offered by the Publications Committee of the National League of Nursing Education, 450 Seventh Avenue, New York, N. Y. Also for the first time the committee is presenting a practical desk pad and calendar.

The wall calendar has some charming pictures of many of the Saints from the history of nursing. The frontispiece is Giotto's famous old fresco of "St. Francis and the Birds" done in colors. Among the twelve attractive plates which appear in the wall calendar are St. Vincent de Paul, St. Elizabeth of Hungary, St. Catherine of Siena, Sts. Cosimo and Damian, and Fabiola. The price of the "Nursing Saints Calendar" is $1.00 per single copy, and $.75 per copy on orders of 50 or more delivered in one shipment.

The desk pad and calendar has a page for each week of the year, with a space for morning and afternoon appointments for each day. That the calendar pad comes from the League is shown by weekly quotations taken from League publications which are as applicable today as when they were written. The engagement pads will be $.50 each, or $.40 if ordered in quantities of 25 or more delivered in one shipment.

CANCER BOOKLETS

THE American Society for the Control of Cancer has put out an excellent series of popular booklets for the laity, giving the main facts concerning cancer and the proper method of procedure. These booklets will be sent to physicians, health officers, as well as to the laity, free of charge, in single copies or in quantities.

The work of this society is too well known to professional men to need comment. We trust that this information will be spread further through the instrumentality of health officers and readers of this JOURNAL.—Address, American Society for the Control of Cancer, 25 West 43d Street, New York, N. Y.

DELTA OMEGA

AT the annual meeting of Delta Omega, the honorary public health society, which was held in the Windsor Hotel, Montreal, Canada, on Monday, Sept. 14, Dr. James A. Tobey of New York was elected national president, succeeding Dr. John A. Ferrell. Professor Charles G. Hyde of the University of California was elected Vice-President, and Professor Ira V. Hiscock of the Yale School of Medicine was re-elected Secretary-Treasurer.

Dr. Mazÿck P. Ravenel of the University of Missouri was elected the ninth national Honorary Member of the society.

The meeting was attended by about 50 members representing the 6 chapters of Delta Omega, located at Johns Hopkins University School of Hygiene, Harvard School of Public Health, Massachusetts Institute of Technology, University of Michigan, Yale School of Medicine, and University of California.

YEAST RESEARCH

MELLON Institute of Industrial Research, Pittsburgh, Pa., has announced that the institution has accepted from the National Grain Yeast Corp., Belleville, N. J., a grant for a comprehensive investigation of the chemistry and technology of yeast. This research, which will be operated as an Industrial Fellowship of the Insti-

tute, will be conducted with the close collaboration of specialists in the donor's organization; and the results will be made available as the various stages of the studies are completed.

PERSONALS

DR. LEWIS H. HOWARD, who has been city Health Officer of Tucson, Ariz., since April 1, has been appointed Health Officer of Pima County, the city and county units being combined. Dr. Howard succeeds Dr. Alvy Nelson Crain, Member A. P. H. A., who resigned to become Health Officer of Maricopa County, with headquarters in Phoenix, Ariz.

DR. ARTHUR HIERONYMUS, Member A. P. H. A., formerly Health Officer for the City of Alameda, Calif., for 20 years, has been appointed Health Officer of the city of Oakland, Calif.

DR. JAMES F. ELDER, Member A. P. H. A., has resigned as health director of Mahoning County, with headquarters at Youngstown, Ohio. He is succeeded by Dr. George Y. Davis. Dr. Elder has been appointed health director of the third district health unit recently organized in the drought area, comprising nine counties, with headquarters at Van Buren, Mo.

DR. JAMES P. MOON, of Tiptonville, Tenn., Health Officer of Lake County, Tenn., has been elected president of the Mississippi Valley Public Health Workers Association, a permanent organization recently formed.

DR. JESSE LYNN MAHAFFEY, of Haddonfield, N. J., has been appointed director of health of New Jersey, to succeed David C. Bowen, whose term expired.

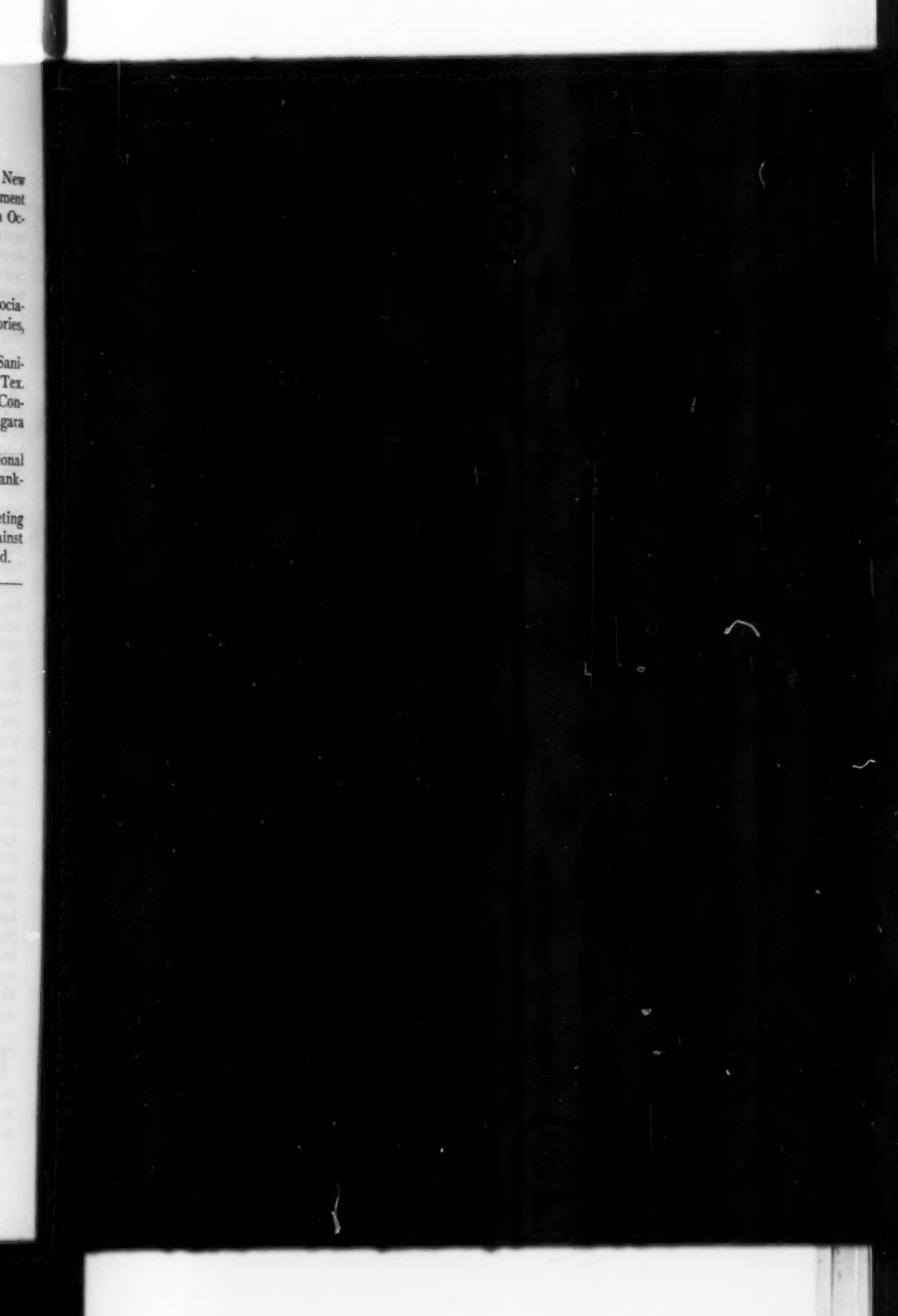
DR. WILLIAM W. BAUER, Member A. P. H. A., Health Officer of Racine, Wis., for the past 8 years, has been reappointed for a term of 4 years. New quarters for the health department will be opened in the city hall in October.

CONFERENCES

November 6, New York State Association of Public Health Laboratories, Albany, N. Y.

November 9–14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

November 10–13, New York State Conference on Social Work, Niagara Falls, N. Y.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

September 6–9, 1932, Annual Meeting of the International Union Against Tuberculosis, The Hague, Holland.